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The Full-Spectrum Radio Magazine

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Monitoring Times®

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★ Barry Goldwater
Reflects on Radio
★ The Building of
WGTG Shortwave

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Vol. 15, No.7

July 1996



Cover Story

On the Road with REACT

By Steve Berk

Will you be on the road over the 4th of July? You may be among the thousands of travelers who take advantage of REACT's Safety Coffee Break, or who use their services when stranded with engine trouble. Radio Emergency Associated Communications Teams, International, has been helping motorists for the past 36 years.

Although Citizen's Band radio has fallen from popularity and REACT's membership has declined, CB isn't the only means of communication used by teams and the need for the service continues to increase. See page 9 to learn more about this non-profit organization which also aids in Special Olympics and other community events. Our cover design is by John Bailey.

Barry Goldwater's Reflections on Radio 12

By Deborah K. Howe

Barry Goldwater is best remembered for the 12 years he spent as U.S. Senator from the State of Arizona. However, radio has had a claim on the interest of this 87-year-old ever since he was thirteen. K7UGA talks with MT about his experiences and opinions on ham and broadcast radio past and present.



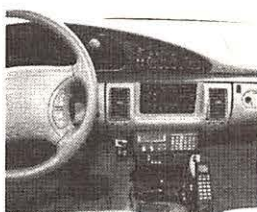
WGTG - America's Newest SW Station 15

By John D. Stephens

Getting an international shortwave broadcast station licensed, constructed, and on the air is an almost monumental task, not to mention the exorbitant cost. That's what makes the achievement of the north Georgia couple who singlehandedly put together shortwave station, "With Glory To God," so phenomenal. WGTG celebrates its first birthday this month.

Seat of Your Pants DFing 20

By John P Seibels



It was the 4th of July—one of the busiest maritime holidays of the year. The author tuned in the emergency calling channel to monitor the action, but what he heard was *BEEP, BEEP, BEEP* ... The Coast Guard's closest direction finding equipment was 70 miles away, so this DXer set out to find the interfering signal using the radios he already had in his car.

Bus Bar Grounding 24

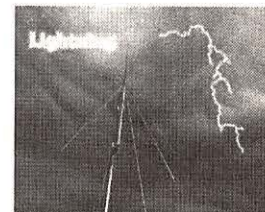
By Arthur R. Lee

If your radio shack involves several pieces of equipment, you could profit from tying them all in to a common ground with this "quick and dirty" busbar.

Absolute Lightning Protection 26

By William A. Rhodes

Folks who live in lightning-prone locales know about lightning rods. But nearly 100% protection for your antennas and equipment from lightning strikes and induced charges is possible.



Reviews:

Brand new to the portable shortwave receiver market is the Sony ICF-SW40.

Selling at less than \$150 on the street, is this radio really as reasonable as it appears? Magne says, though it's no DX machine, this may be the one to recommend to acquaintances wanting to try shortwave broadcast listening. (See page 98.)

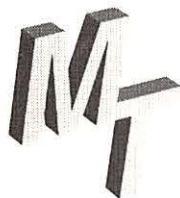
The Max system discone for portable scanners has a snazzy appearance, but how does it perform? Bob Parnass evaluates this unit and also tracks the development of the service search concept in scanners, of which the Beartracker BCT-10 is the latest model. Though not for everyone, this little scanner can be very useful for mobile applications. (See page 100.)

Haskell Moore tries his hand at his second computer interface installation with the Optoelectronics OS535, made for use with the PRO-2035/2042 scanners. This little board has more to it than meets the eye! (Page 96.)



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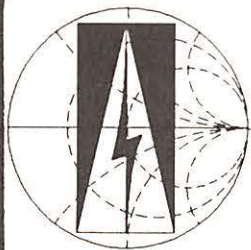
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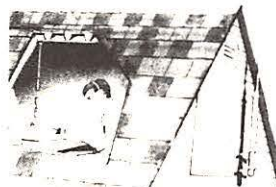
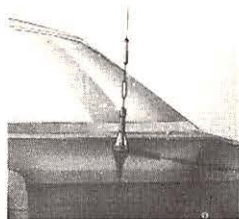
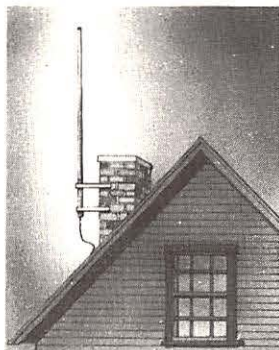
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A Toast for Two Larrys!

Two staff members celebrate significant milestones in their association with *Monitoring Times* this month. Larry Van Horn edits his 100th "Utility World" column in this issue. Larry began as "Signals from Space" columnist in 1984, but his meticulous work logging, researching, and reporting on HF communications has earned him well-deserved respect in utilities as well. He remembers some of the memorable moments and discoveries made over the years in his July column.

Not as immediately obvious (since the nature of his current columns gives him little opportunity to editorialize), is the fact that Larry Miller celebrates his tenth year with *Monitoring Times*. This anniversary has a very special significance in the life of the magazine as well, since it marks the incorporation of Miller's shortwave magazine, *International Radio*, into the primarily scanner and utility oriented *Monitoring Times*. Larry Miller held the posts of Shortwave Editor and then Managing Editor, until July 1991. Currently, of course, he brings his inimitable style and sense of the bizarre to the new and to the news.



Raise a glass of your favorite brew and join me in a toast to these two hobbyists whose contributions to the evolution of *Monitoring Times* are probably surpassed only by Bob Grove himself.

Radio Free Berkeley

A Constitutional Difference of Opinion

• "When I opened my recent copy of *Monitoring Times*, I sat in total disbelief as I read

your article, 'Free Radio Berkeley!' ... (Author) Marcus Harton III, AE4EX, in my estimation did your magazine a disservice by not only featuring, but glorifying Stephen Dunifer's role as a maverick radio pirate who admittedly thumbs his nose at the FCC and, in essence, the many law abiding radio station operators who conform to the standards of not only the law but common decency.

"How would Mr. Harton (an Extra Class amateur) feel about others using an assumed FCC Call designation? Or without any authority, cluttering and interfering with his air waves with total disregard for regulations? It's hard to imagine anyone who takes any pride whatsoever with any legally earned license, portraying such egomaniacal behavior to be anything less than professionally degrading and disgusting."

"*MT* even grants free advertising for the commercial aspect of the operation in terms of availability of kits, and even the address for more information. This is not representative of the conduct or quality of publication one would expect from *MT*."

—John W. King, Aptos, California

• "At issue is the principal of radio station licensing. Station licensing gives the public reasonable assurance that certain technical standards are maintained and that we will receive quality, interference-free broadcasts. License requirements for station technicians assures us that competent personnel maintain these required standards.

"The Free Radio Berkeley staff are free to raise money for a 100-watt community station and apply for a license. A second choice is to find a liberal local talk show host who will allow them on the air regularly. Given the liberal slant of many broadcasters, this should not be a problem.

"I understand Judge Wilkens' reluctance to issue a restraining order. The case has not yet been resolved and she believes there may be a Constitutional issue involved. ... This is called due process."

—John Henry Hart, Philadelphia, Pennsylvania

• Stan Lopes KB6LGV, of Concord, California, submitted a newsclipping by staff writer Emily Gurnon from the *Contra Costa Times*, which is "about 12 miles away from all those 'flakes.'" "Interesting arguments," he adds.

Here are some of the highlights:

Dunifer supporters describe the case as a battle over control of the airwaves—the grassroots community versus corporate media giants.

Louis Hiken, Dunifer's attorney, told the court, "The FCC does not issue licenses for stations under 100 watts. Even if Dunifer had applied, it would have been a futile act."

The Federal Communications Commission says it's a simple matter of excluding micro-broadcasters who clog the radio dial. The rationale for not permitting low-wattage stations is that it is in the public's interest to have fewer moderate-to-large-sized stations rather than more small operators, FCC attorney David Silberman said. With too many stations, signals would interfere with each other and create chaos.

The judge agreed to hear arguments showing that discrimination based on finances resulted in discrimination based on content. One written declaration was by Robert McChesney, a journalism professor at the University of Wisconsin, who wrote: "The content of broadcast information is largely determined and affected by those who own and sponsor the broadcasting station. The content of non-government, non-corporate-sponsored stations will be substantially different from other stations."

Reader Responses

March issue, "What's New?" on Yupiteru MVT-7200, p.93: "ACE Communications of Indianapolis sells the MVT-7200 only to special groups such as government, law enforcement, and telecomm organizations. While they'll sell old AR-1000s, they will not sell the AR-2700 and AR-8000 (even sans cellular). EEB sells these radios, with or without cellular, to the right groups of people. MVT-7100s and modified AR-8000s are sold in the commercial section.

"Atlantic Ham Radio sells all major Yupiteru, Uniden, and AOR radios, from Toronto. They say US Customs is basically interested in their money, about \$65, not frequency coverage.

"The MVT-7100 and -7200 are akin to the AR-2700 and AR-8000. I have been informed that Yupiteru, Trident, and AOR scanners are about the same. There are two basic key pads, with the AR-2700, AR-8000 and MVT-7100/7200 have a more agreeable VFO. The AR-1000 is akin to the TR-1200, and the old AR-1500 to the TR-2400. Overall SSB stability and 28-1000 MHz sensitivity are both very good on the MVT-7100. It really is a very good radio!"

—Norman W. Hill, Arlington, Virginia

(Continued on Page 104)

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APF!**



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FCC: RFI? Not Our Problem

Interference has long been a bone of contention between the hobby radio community and the neighbors who sometimes must put up with interference to their televisions, radios, audio systems, telephones, and other home electronics. The FCC receives thousands of such complaints every year. But no more.

Now, in a landmark (sort of) decision, the FCC has basically placed the blame for interference on the person *receiving* the interference (!!).

To quote the *W5YI Report*, the FCC's bulletin CIB-10 states that most interference (1) is caused by the design or construction of consumer electronic products and not by the radio operator and (2) is a technical problem, not a law enforcement problem. The bulletin then invites consumers to file a complaint — with the manufacturer, not the FCC!

FCC Cash Update

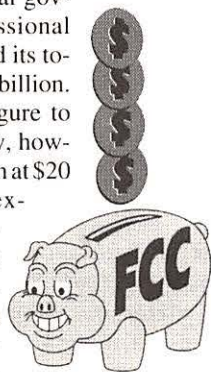
At the same time that the FCC is handing off involvement in RFI complaints, it continues to flood the federal treasury with money. In 1993 when Congress first authorized the selling of the public airwaves to raise money for our bankrupt federal government, the congressional budget office estimated its total take would be 10.2 billion. It later lowered the figure to \$8.1 billion. As of now, however, the figure clocks in at \$20 billion. "We have exceeded all expectations," crows FCC chairman Reed Hundt.

Meanwhile, the FCC's auction schedule continues at a furious pace with spectrum for Personal Communications Services in smaller markets now on the block.

Is any spectrum safe?

Hundt, feeling particularly generous, has proposed that broadcast networks be forced to give free airtime to presidential candidates.

What about hams? Some of their allocations are sparsely used. With the dollar value now assigned these frequencies, can it be long before the wolves in Washington start licking their chops over the ham bands? Sound far-fetched? According to *Worldradio*, the Congressional Budget Office is already evaluating the ham bands as well as several other services for their potential auction value.



Berkeley Pirate Wins Again

Radio Free Berkeley, the 25-watt FM pirate David that's in a protracted battle with the federal Goliath, has again won a stay of execution. The station, which now broadcasts 24 hours a day with a staff of 100 volunteers, went before U.S. District Court judge Claudia Wilken. As expected, the FCC said that unlicensed stations are illegal and asked for an injunction shutting the facility down.

Dunifer, RFB's founder, argued that he is unable to get a license because the FCC doesn't allow stations under 10 watts on the air.

Judge Wilken refused to issue the injunction and asked Dunifer to present facts showing that discrimination based on finances results in discrimination based on content. And so, like the Energizer Rabbit, Radio Free Berkeley just keeps on going and going and going. The station recently celebrated its three-year anniversary.

Helping Ham Reaches Across a Continent

The *Cambria*, a 44-foot Canadian yacht, was sailing southwest of Jamaica when it grounded on a reef. The vessel quickly began to sink, a large hole punched in its side. Water flooded in at an alarming rate and before long, the vessel was lying on its side. To make matters worse, weather reports had predicted a storm in the area. Because the ship was on its side, radio communications were difficult and the crew was unable to notify anyone of their predicament.

In Encino, California, ham radio operator Bob Karon was surfing the ham bands when he came across a weak signal. It was the *Cambria* calling a frantic Mayday.

Karon contacted the yacht, then the Coast Guard in Los Angeles. Handed off to the Miami station, Karon remained the only link between the Coast Guard and the sinking vessel.

Eventually, the *Cambria's* crew of four was rescued by a nearby freighter who took the castaways to Aruba. Karon, call letters AA6RK, received a letter of commendation from the Coast Guard.

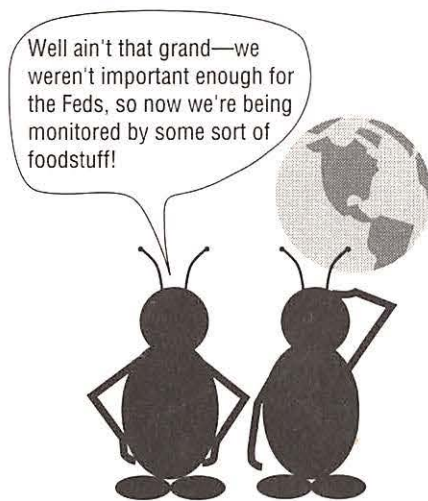
Ham Helpers Part 2

The Lambda Amateur Radio Club (LARC), a group of "gay, lesbian, bisexual, and transgendered hams," has had a fund raiser for hurricane-devastated hams in Anguilla. The group raised \$1,050. LARC is now a full-

fledged ARRL-affiliated club. Only a few years ago, the ARRL wouldn't even take their advertising.

Ham Helpers Part 3

Are we alone in the universe or is there life on other planets? The SETI (Search for Extra-Terrestrial Intelligence) League wants to know and is enlisting the help of ham radio operators (and presumably anyone with a general coverage receiver). All you need to conduct your own search for intelligent life on other planets is an antenna of nine feet or more, a radio of sufficient sensitivity, and a computer with software that the league provides.



While the U.S. government was spending \$6 million a year (before Congress cut the funding in 1993), the SETI League believes that thousands of radio hobbyists, all with their antennas pointed in the same direction, can do the job for free.

Want to get in on the fun? There's no mail address, but you can contact the SETI group at their website: <http://www.seti-inst.edu/>

No Cordless Listening in Oregon

Are cordless phone calls public or private? The issue has gone back and forth in Oregon for years. It came up when a Redmond man was arrested on drug charges after a neighbor with a scanner overheard and taped his phone calls.

The case was thrown out at a pretrial hearing when the judge ruled that the information on which the arrests were made was illegally obtained. That reasoning was overturned in March of 1993 when the Oregon Court of Appeals ruled that cordless and cellular calls are public because they are

COMMUNICATIONS

broadcast over radio. Most recently, the Oregon Supreme Court ruled that not all radio transmissions are radio broadcasts and that cordless phone conversations "are not intended for the whole community."

Regardless, officials concede that the ruling has little effect other than to cause the release of a man convicted on drug charges. "In reality, people use scanners all the time," says Beth Givens, project director at the Privacy Rights Clearing House. "They listen to phone conversations, both cordless and cellular. Detection is almost impossible." Who are these nasty people?

911 By Mail

It was 3:33 AM when 22 year old Tracy Plamondon called Clark County, Washington, 911. Her old boyfriend, it seems, was wild with jealousy about her new beau. The old boyfriend, Nick Waldrip, called and said that was coming to Plamondon's apartment and kill the new boyfriend. Terrified, the young woman called 911.

The dispatcher told Plamondon to mail in a report.

Too late. When Plamondon returned to her apartment she found Nick Waldrip inside, licking a Cabray 9mm machine pistol. Seventeen shots were fired but fortunately, no one was injured.

Clark County 911 chief Thera Bradshaw admits that the dispatcher made a mistake in trying to handle the complaint by mail. "We are human. Sometimes we make mistakes."

Lesh Talk

Iraqi TV, we are told, is usually pretty boring. Low on entertainment and high, as reporter Craig Warg reports, on fawning.

All of that changed for a brief period last month when Uday Hussein started some on-air fireworks.

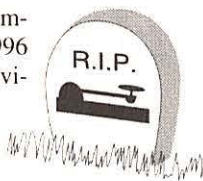
According to reports, the Iraqi dictator's son, "drunk as a lord and surrounded by bodyguards," stormed into the Iraqi TV building brandishing a pistol and demanding to make an impromptu speech to the nation.

Though any time anyone with a gun enters a TV station demanding airtime, it's delicate, when the dictator's son arrives and does so drunk, it's time for some very special handling. The staff of the station called father Saddam and sought his guidance.

Father wisely suggested the station tape Uday's statement. Viewers were later offered an apology that blamed the interruption on "technical reasons." The tape never aired.

Dit dah dit dah dit

Included in the Telecommunications Act of 1996 was a little-noticed provision that put another nail in Samuel Morse's coffin. Ships equipped with the Global Maritime Distress and Safety System (GMDSS) are no longer required to carry manual Morse code radio telegraph equipment. Previously, U.S. flagged cargo vessels of more than 1,600 gross tons and all flagged passenger vessels had to have a Morse code installation on board.



HSRN

ABC and NBC move over. A new network is on the way — the Howard Stern Radio Network.

Stern, self-described "King of All Media," announced the new network as part of a five-year contract he inked with Infinity Broadcasting.

Stern spokesman Don Buchwald says that programming for the network will not be developed "in any quick fashion."

"We're going to take as much time as necessary until it reaches Howard's standards, which for radio are high." Quality. Yes, quality. Very quality.

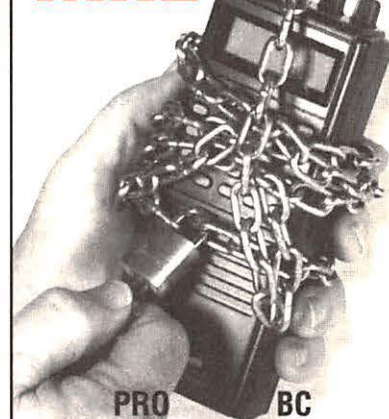
Stern is currently carried in 24 major markets and is now looking to import his sexually-oriented radio show into smaller markets as well.

"Communications" is written by Larry Miller with help from Rachel Baughn and the following members of the *MT Communications Media Monitoring Team*: Dave Alpert, New York, NY; Alton Coffey, Grand Prairie, TX; Lou Gabrielson, Amityville, NY; Paul McDonough, Somerville, MA; Jim Moodie, Portland, OR; Fred Pierce, Sherman Oaks, CA; Ralph Quintero, Northlake, IL; Richard Sklar, Seattle, WA; Walter Szczepaniak, Philadelphia, PA; Robert Thomas, Bridgeport, CT; Arnold Weiner, Brentwood, NY; Phil Yasson, Vancouver, WA; and Matt Young, Lexington, OH.

We have also consulted the following publications and list their names in appreciation: *National Scanning*, *Parade*, *Radio World*, *Worldradio*, *W5YI Report*. For the text of CIB-10 see <http://www.fcc.gov>

Thanks to everyone who made this column and the past 10 years possible.

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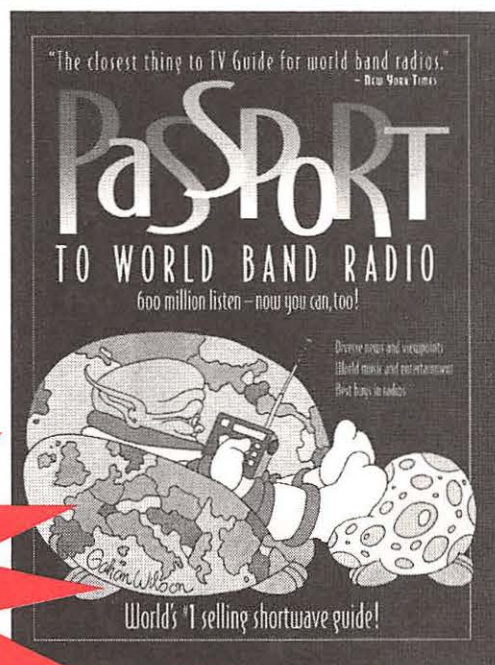
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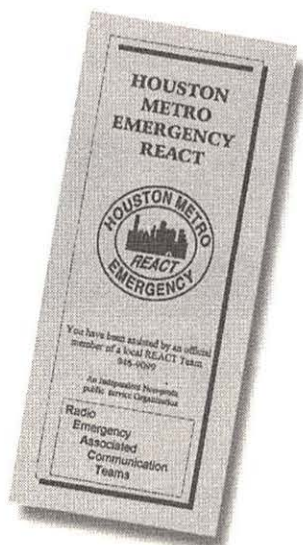
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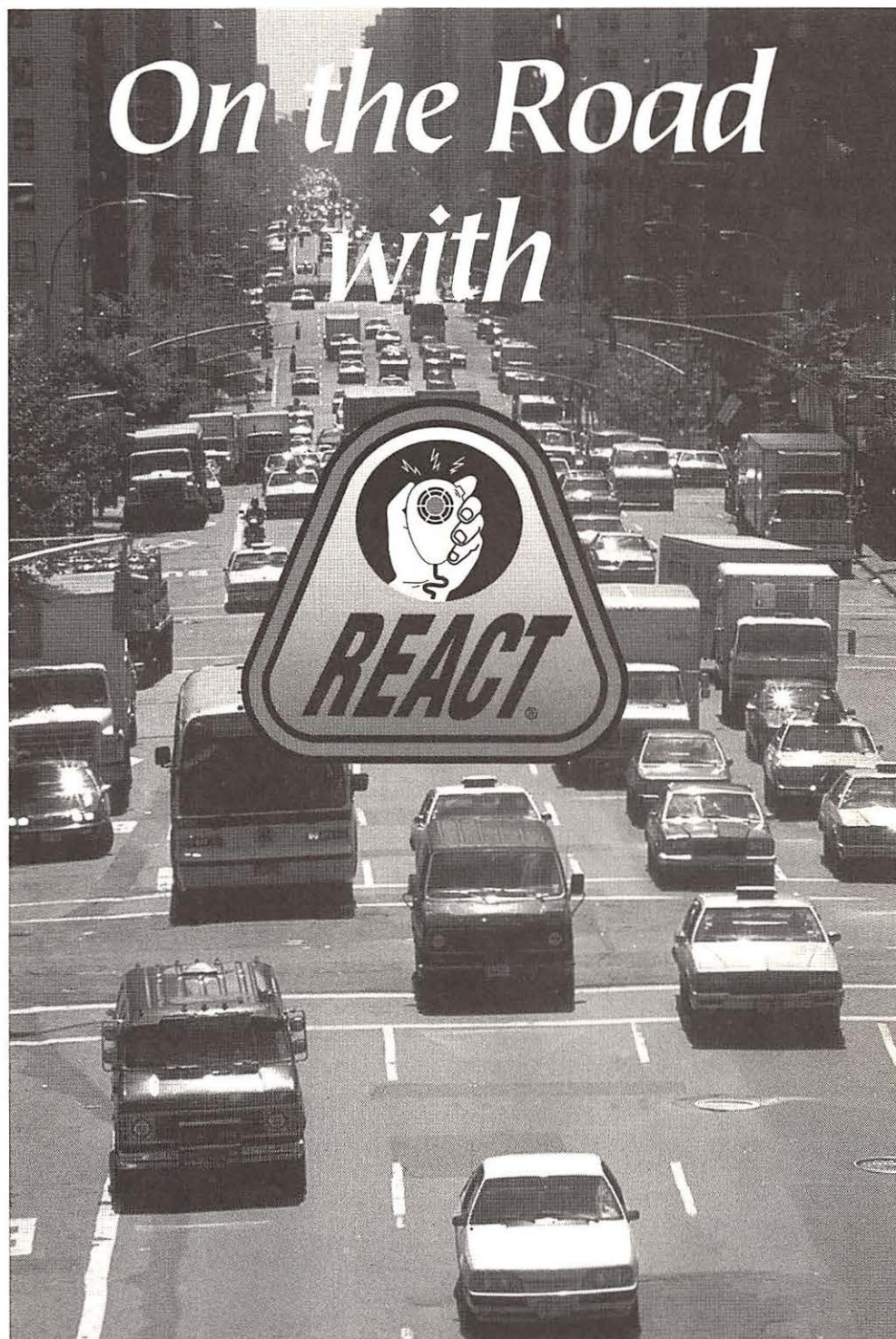
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Materials distributed by REACT instruct motorists on how to call for help.



By Steve Berk

You don't have to own a Citizen's Band (CB) radio to know what REACT is all about, but it helps. The 36-year-old public service oriented communications organization is still very much alive and well across the country and around the world. With its headquarters in Wichita, Kansas¹, REACT International, Inc. oversees team operations in locations such as the United Kingdom, Canada, Australia, West Indies, and Germany, just to name a few.

REACT — an acronym for *Radio Emergency Associated Communications Teams* — is best known for its motorist assistance activity on CB channel 9. Even those who don't use CB radio take advantage of one of REACT's more popular projects, the *Safety Coffee Break*, which is set up along

major highways across the country, especially during holiday travel periods. Motorists are encouraged to stop for a free cup of coffee and some relaxation before continuing on their trip.

Local REACT teams also have a major role in providing essential communications for community events such as parades and civic activities, and are always behind the scenes in a similar function for the March of Dimes and Special Olympics.

REACT was founded in 1962 by Henry "Pete" Kreer, who stopped to assist a family by using his CB radio to call for emergency help. Kreer, with the help of the Hallicrafters Radio Company, eventually formed what became one of the world's largest volunteer emergency communications groups. In 1970 the Federal Communications Commission (FCC), recognizing REACT's efforts, designated channel 9 as the official emergency channel nationwide.

Citizen's Band radio's popularity reached its peak in the mid 70's. CB radios were found in just about every 18 wheeler on the highway, as well as in police cars and emergency dispatch centers. Even First Lady Betty Ford was on 27 megahertz. But by 1979 CB's popularity fell significantly, and in 1983 it was finally deregulated by the FCC.

Unfortunately, along with the decline in CB radio sales, REACT experienced a drastic reduction in membership as well. In 1989 REACT boasted a dues-paying membership of 12,000 among 800 teams. Today that count has dropped to some 3,645 members and 439 teams in the United States and Canada.



GMRS coordinator Ed Williford instructs a Special Olympic Committee official on the proper use of the 900 MHz trunked radio, including which system and sub group the user needs to be on.

■ REACT to the Rescue

REACT teams still use CB radio to assist motorists who rely on low cost communications for help. Instead of haphazardly listening to channel 9 and trying to figure out what to do in an emergency, REACT International developed a training program for CB Emergency Channel 9 monitors. A contract awarded by the U.S. Department of Transportation's National Highway Traffic Safety Administration funded the training program. Pamphlets are also circulated nationwide to instruct motorists on proper procedures to use when calling for help in an emergency.

Since REACT is a 501 (c)(3) non-profit public service organization as recognized by the Internal Revenue Service, team members are not permitted to accept compensation from motorists they assist in the field while under their REACT banner. However, donations to the local team or to REACT international are graciously accepted, but not solicited. The non-profit status is also enjoyed by REACT teams in Canada.

While the majority of REACT's communications activity is still carried out on CB radios, more serious and sophisticated communications channels are open on the General Mobile Radio Service (GMRS) bands in the UHF spectrum.

UHF repeaters owned and operated by REACT teams dot the country, providing more reliable communications and greater range. GMRS repeaters are costly to erect and maintain, so team members usually pay a monthly fee as the repeater is also used for personal communications between family members and other teammates. In addition to the GMRS fee, team members pay REACT International an annual membership fee of \$20 for the first member of a family and \$18 for each additional member. Local teams can add to the yearly dues for their own financial stability.

Unlike CB radio, GMRS still requires a license which is obtained for a \$60 fee (no test required) and is good for five years. Presently, the FCC is considering the deregulation of the eight GMRS repeater frequencies in favor of a proposed service called the Family Radio



Being a REACT communications volunteer isn't all fun and games. Here, the GMRS coordinator is forced to pose with some of the Houston Oilers Derrick Dolls.

Service. REACT teams around the country are strongly opposed to the idea, fearing that unlicensed users, and the influx of radios would interrupt repeater communications used for essential public safety messages. (See MT's Feb issue for more on GMRS and FRS.)

A comprehensive listing of the REACT repeaters across the country can be found in the *National Repeater Guide* published by the Personal Radio Steering Group (P.O. Box 2851, Ann Arbor, Michigan 48106). Although not officially dubbed so by the FCC, 462.675 MHz (467.675 for transmit) is the frequency used as the motorist assistance channel nationwide. REACT repeaters on this frequency in many cases are operating on open squelch, but the most common CTCSS tone for REACT is 141.3 Hz.

As of 1976, REACT became an independent non-profit public service organization, which makes it an excellent choice for local businesses looking for a worthy cause for donations. In many communities across the land, REACT members work side by side with local law enforcement officers in the interest of public service and safety.

On its 20th anniversary in 1982, REACT International received the President's Volunteer Action Award, one of many awards bestowed over the years for the volunteer work team members perform.

■ How it works in Houston

Houston Metro Emergency, Inc.² is team # 4098, and is one of three teams under what is known locally as the STAR council: South Texas Area REACT.

Houston Metro is very active in Special Olympics events and fund raisers. Being a relatively small team charged with the responsibility of providing communications to an organization like Special Olympics, Houston Metro relies on help from Brown & Root, a Houston oil industry engineering and construction company. Brown & Root generously donates as many as 50 of their 900 MHz trunked portables to Houston Metro, which in turn assigns them to the principals who supervise the Special Olympic events at the various sites around Houston.

Brown & Root also provides UHF radios when needed, which they kindly program to the Houston Metro team frequency (462.725 MHz) and CTCSS tone (141.3 Hz) then re-program back to their own frequency on return. Without Brown & Root's community spirited help, Houston Metro wouldn't be able to assist Special Olympics to the extent they now do.

The REACT team is responsible for the radios, and team members take painstaking measures to guarantee each radio's return to Brown & Root in good condition and fully charged.

All REACT team members carry an identification card issued by REACT International. In many cases the card will include a photograph of the member. Motorists who are apprehensive about accepting help from a stranger can ask to see the REACT ID card.

If two-way radio communications is one of your pleasures in life, along with a desire to be involved in your community and to help other people, then REACT is for you. Look in your local phone book under REACT, or you can contact REACT International at 316-263-2100 for a REACT team in your area.



Ed Williford and Donna Lantz check out two of the Brown & Root 900 MHz trunked portables to Special Olympic Committee officials at a celebrity fund raiser held at the Houston Astrodome.

¹ REACT International, P.O. Box 998, Wichita, KS 67201; ph. 316-263-2100; www.reactintl.org.

² Houston Metro Emergency REACT, P.O. Box 7361, Houston, TX 77248, 946-9099.



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Barry Goldwater's Reflections on Radio

By Deborah K. Howe

Senator Barry Goldwater told me the other day that he was probably the oldest ham alive. That may be a slight exaggeration, but at the age of 87 he is certainly a contender for the title. Just consider that he was building radios before vacuum tubes found their way into the common man's shack.

Nonetheless, I like to think of the Senator as at least *the most famous ham*. After all, what other amateur radio operator has been intimate with five U.S. presidents? He was so close that on his advice one of them resigned his office.

In the past, Goldwater's radios have been a conduit for presidential conversation. On one occasion, President Reagan contacted him while the senator was piloting himself over his home state of Arizona. "Whenever I fly I talk," Goldwater told me. "Heck, that's how I learned Sandy O'Connor [a former Arizona state senator and the first woman appointed to the U.S. Supreme Court] was put on the Supreme Court. I was flying right there at 45,000 feet," the senator said as he pointed up into the crisp desert air outside his living room window, "and I got a call from Washington: 'The President wants to talk to you.' They gave me a frequency and I tuned it in. I called for the President and back he came. He says, 'I thought you ought to be the first one to know. I appointed Sandy O'Connor to the Supreme Court.' 'Well', I said, 'that's wonderful because I'm in spitting range of my town. I'm right over the middle of Phoenix.'"

Did this conversation take place on an unclassified frequency? You bet it did. Short wave listeners who may have been scanning the bands and happened upon this extraordinary QSO would have scooped Dan Rather on this momentous occasion.

Besides talking when he flies, the senator enjoys scanning air traffic. "I can sit there and listen to the aircraft ... their conversations when they take off and land. I listen to the fighter pilots going out of Luke."



The antenna atop Senator Goldwater's shack.

"I've had hobbies all my life. In fact, it's hard to find something I haven't done. I've kept busy...flying for thousands of hours, reading every kind of book, building hundreds of model planes and ships, tinkering with different cars, taking thousands of photographs and developing them, talking on my ham radio, camping, hiking, and canoeing across the west, assembling one new gadget after another, writing many letters, collecting and playing hundreds of Dixieland jazz records, swimming, and now soaking in the hot tub."

■ What's Boredom?

Another title for which the senator is a contender is *the man with the most hobbies*.

"I've had hobbies all my life. In fact, it's hard to find something I haven't done. I've kept busy...flying for thousands of hours, reading every kind of book, building hundreds of model planes and ships, tinkering with different cars, taking thousands of photographs and developing them, talking on my ham radio, camping, hiking, and canoeing across the west, assembling one new gadget after another, writing many letters, collecting and playing hundreds of Dixieland jazz records, swimming, and now soaking in the hot tub."

He labels himself a *weather nut*, his interest in atmospheric conditions having been sparked decades ago. "I had a [see saw] when I was a Boy Scout. It's a tricky little gadget. There are two buckets and if there's no rain they're perfectly balanced. When there's a rainfall, one drop will fall down and hit this side of the bucket, and when there are enough raindrops in that side of the bucket, it tilts, and when it tilts it closes the circuit and tells the instrument there is 1/10 of an inch. Now, when the other side gets enough water, it goes down, so it tells you another story. I used to go crazy sitting there watching it."

Today, in the corner of his living room, next to a window that overlooks a desert studded with the kind of cactus that only grows within hailing distance of the Mexican border, a Rain Bird digitally reports the weather. With the turn of a big black knob, one can read the outside temperature, inside temperature, barometric pressure, wind speed and direction, and the rainfall. Watching the rainfall in Phoenix?! Even the senator admits, "Well, with the weather here, you're wasting

a lot of time. But we get storms and then it gets interesting." But most days the see saw remains in perfect balance.

Ham radio is the hobby that has held the senator's interest the longest. "I started when I was about thirteen years old and I've kept at it. I've been at it ever since the age of spark coil and a crystal set to receive. On a real good night I could hear Los Angeles, but not very good. Then the vacuum tube did away with the crystal sets for receiving. The trouble with the vacuum tubes—they were quite a bit of money in those days. I think it was about a dollar a watt. So I picked cotton one summer and made enough money to buy a ten watt tube. In those days it was very easy to make the tube receiver, but nowadays they're so complicated—black boxes with secret circuitry."

■ Putting His Hobby to Work

Amateur radio is a pastime the senator has put to good use. During the Vietnam war he had a radio station through which he ran 300,000 phone patches connecting servicemen and women with family and friends back home.

Under different, more benevolent circum-

stances, the senator happened upon a call for help. "Yes, I think I saved a couple off Ensenada. I heard them one day sending a May Day—a May Day is an SOS. So I called them on the frequency they were on. I said, 'What's your trouble?' They said, 'We don't know where we are.' 'What's your last point of knowledge?'" he asked.

With the little information they could give him, he got out his map, and sent out an emergency May Day to the Coast Guard to whom he relayed the information. "'I don't know exactly where this ship is, but he's in trouble. It's a sail boat with not much wind and no power.' And by God, that Coast Guard found them and brought them into port. I've had several cases. Out there on the water, you know, you're out there all by yourself."

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Ham radio is the hobby that has held the senator's interest the longest. "I started when I was about thirteen years old and I've kept at it. I've been at it ever since the age of spark coil and a crystal set to receive. On a real good night I could hear Los Angeles, but not very good. Then the vacuum tube did away with the crystal sets for receiving. The trouble with the vacuum tubes—they were quite a bit of money in those days. I think it was about a dollar a watt. So I picked cotton one summer and made enough money to buy a ten watt tube."



When I mentioned to the Senator that there are people who believe in sailing without radios (they call themselves purists), he responded in his traditionally blunt style: "Oh, I think they're out of their heads."

■ Brought up on Broadcasting

Also to his credit, while in high school the senator helped build the first radio station in Phoenix, KFAD, now known as KTAR. The senator used to hang around the site. "I'd sweep the place out, picked up all the dirt, and they finally got to building this [250 watt] transmitter for the first broadcast station and they let me help build it. I could pour the solder. And I don't even have a picture of that." When KFAD first began, the radio station mostly played records: "They hadn't developed any talent."

The mention of talent opened up a whole new arena of questioning: the senator's view on the development and evolution of talent in an era when *shock jocks* can be heard in every city. I asked if he knew of Howard Stern (the syndicated king of shock jocks).

"Yeah, and the guy that's on the Republican ... Rush Limbaugh. I see nothing wrong with that as long as they don't go into talking about classified material. Now if a fellow started talking about some of the performance statistics of the F-14 and F-15, I would say that was wrong and I would report him. There are

some, though ... we've got one or two around this state...who sort of preach doing harm to other people. And the answer is, they have the right. When you talk about free speech, it's hard to get around. I think people have to be careful." Liberal words from the conscience of the conservatives.

On the other hand, in regard to government funding of public radio, he feels that there should be some control.

"Now, if you want to look at the whole subject of public broadcasting, there's parts of it that are so bad that you can say, 'Let's do away with the whole thing.' But I would rather say, 'Let's get the offenders and clean them up.' I say that because in Arizona we have, I think, the finest public broadcasting station there is over at Arizona State College.

They do a good job."

And his view on radio in general? "Well, I think the broadcast industry has been a great asset to America. I think of people being able to sit in their living rooms listening to performances, and the whole subject of radio has made living better."

■ K7UGA on the Air

Born into a new millennium during a time when Marconi was still developing communication by radio waves, the senator didn't hesitate to jump feet first into the twentieth century. He easily made the leap from homemade cat-hair-whiskers and dainty-crystal receiving sets to integrated circuitry by Kenwood. The senator admits that "It's kind

of fun talking to people," and can still be heard on the ham bands under the call sign K7UGA.

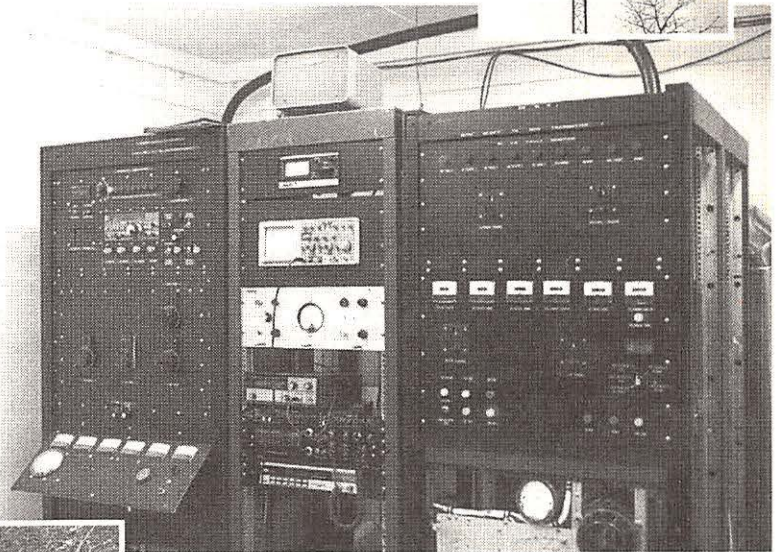
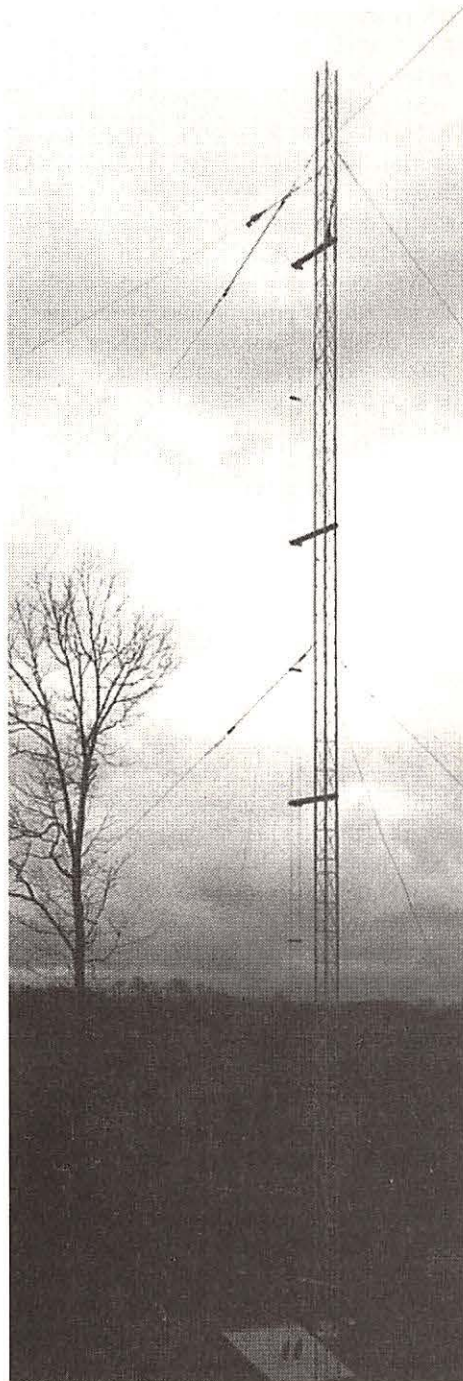
His favorite band is twenty meters, mostly because he labels himself a "lazy kind of guy"—he doesn't like to retune. "But I use everything from 80 to 10 meters, and now I use 2 meters and 6 meters, and any oddball frequency that comes along." So if you hear someone identify himself as Bravo Alpha Romeo Romeo Yankee, it just might be the most famous ham looking for a good ragchew.



America's most famous ham, K7UGA, would rather be pursuing one of his many hobbies than posing for the author's photo. Senator Goldwater has been interested in radio since he was thirteen.

WGTG — America's Newest SW Station

By John D. Stephens
Photos by Adrian Peterson



"With Glory To God"

Situated at the top of Georgia, WGTG is a "work in progress"—an impressive labor of love by David and Roseanne Frantz. Everything is home brew here except the satellite dishes, from which the station draws much of its programming. Story begins on next page.

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Georgia — home of the '96 Summer Olympics, Antebellum mansions, Newt Gingrich, mouth-watering peaches — and the newest shortwave voice from the United States, WGTG.

WGTG, whose motto is "With Glory To God," is owned and operated by Mr. David Frantz and his wife, Roseanne. No large broadcasting organizations or worldwide religious denominations with big bank accounts are behind this station — just the Frantzes, who say that they're "simply Christians who want to glorify God." This is just the first of many things that make WGTG an unusual addition to the airwaves.

■ Radio with a View

Located in the extreme north central section of the state in the town of McCaysville, just a couple of miles from the point where the borders of Georgia, Tennessee, and North Carolina meet, WGTG sits atop an unnamed mountain overlooking the Toccoa River. The station's "high country" rural setting offers a panoramic view of winding rivers, lush forests, and the Appalachian mountain range.

At the beginning of the decade, Mr. Frantz — who is also WGTG's engineer, as well as a DXer and active amateur radio operator — was working as a pilot. By his own admission, he would have chuckled at anyone suggesting he might someday be operating his own international broadcast station. However, according to Frantz, about two years ago he and Roseanne felt a calling to "go out and preach the Gospel to the world" via radio, and they wasted no time in applying for a broadcasting license.

The search for a location for their station soon began. The Frantzes picked the McCaysville site because they were familiar with the area. They also felt that the remote location would greatly reduce the risk of interfering with residents' television sets. After

about six months, the construction permit for WGTG was granted and the work began.

■ Now That's a Do-It-Yourself Project!

As Mr. Frantz began shopping for transmitters, he was dismayed by the hefty price tag — up to 290,000 dollars — for transmitters that would deliver 50,000 watts (the minimum required by the Federal Communications Commission for U.S. shortwave outlets). After a great deal of soul-searching, he decided there was only one way to go — build his own!

Applying his considerable technical expertise, Frantz produced a rig which would be the envy of many stations. Besides producing the necessary 50 kilowatts, the microprocessor-controlled WGTG transmitter has auto-tune capability, and transmission frequencies can be changed within seconds at the touch of a button. With a memory storage capability of up to ten different frequencies, the transmitter can even be operated remotely via a touch-tone telephone!

Even the station's antennas — a yagi and a 900 foot rhombic — are "home-brew." The rhombic was used for testing and is now in service for broadcasts to all parts of the world. The yagi, cut for the 19 meter band and mounted on an 80 foot tower, was intended for transmissions to Canada and Mexico.

■ Great Results on First Test Broadcast

At about 1945 UTC on Saturday, July 29, 1995, WGTG's first test transmission aired. Consisting of a tape loop station identification by Frantz, the station's telephone number and mailing address were announced. Listeners were invited to write or call in their reception reports.

Although the broadcast lasted only a couple of hours, about 30 telephone calls were received from all over the United States, Canada, and Mexico. Frantz remarked how surprised

he was that so many people could receive WGTG during that test, in spite of the frequency in use (7355 kilohertz) and the time of day. It boded well for their future broadcasts reaching the intended target areas.

■ Current Plans and Programming

What kind of programming can listeners expect when tuning in to WGTG? According to Frantz, "The material on WGTG will be Biblically-based. If you want to put a label on it: 'fundamentalist broadcasting' ... just basically out of the Bible." Programs are a mix of self-produced and satellite-fed material, shows produced by organizations that lease transmitter time, and some programs on DXing and amateur radio.

Initially, WGTG was authorized to conduct test transmissions on 7355 kilohertz on a limited basis only. Eventually, an application was filed with the FCC for authority to test seven days a week.

WGTG began a regular broadcast schedule last fall. As program lineups continue to be established, Frantz notes that there are still "lots of odds and ends to finish up," and that he's anxious to "get everything 100 percent complete."

Currently, you'll find WGTG on daily from 1000-0400 UTC using 9400 kilohertz. As with any shortwave broadcasting, times and frequencies are subject to change. Should you hear the station, you may telephone Mr. Frantz with your reception report at (706) 492-5944. Or, write to:

Mr. David Frantz (WA4SZE) - Engineer
c/o Radio Station WGTG
P.O. Box 1131
Copper Hill, Tennessee 37517, U.S.A.

A second transmitter was being worked on as this article went to press, although Frantz remarked that just getting the first transmitter up and running was such a huge undertaking, it might be some time before this comes to pass. It is reported that Frantz hopes to broadcast around the clock on 6960 if authorized, using a 7-element dual-band 5/7 MHz yagi.

The many entries in Glenn Hauser's "Global Forum" column over the past year are witness to the ups and downs of WGTG's search for effective frequencies and appropriate programming. That column will continue to track the progress of this ambitious little station.

WGTG is now sending out very attractive QSL cards which any DXer would be proud to have in his or her collection. And, while you're at it, be sure to congratulate Mr. and Mrs. Frantz on their first anniversary of international shortwave broadcasting!



With its facilities still under construction, the station is situated in a "high country" rural setting offers a panoramic view of winding rivers, lush forests, and the Appalachian mountain range.

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Space: A New Frontier for the Grove Expo

By Larry Van Horn
Expo '96 Publicity Chairman

Not only is space a new frontier in mankind's exploration of the universe, but it is also a new monitoring medium for most radio hobbyists. At this year's Grove Communication Expo 96, the staff of *Satellite Times* magazine will present many different facets of space monitoring available to the radio listener at forums scheduled on Saturday and Sunday of the Expo weekend.

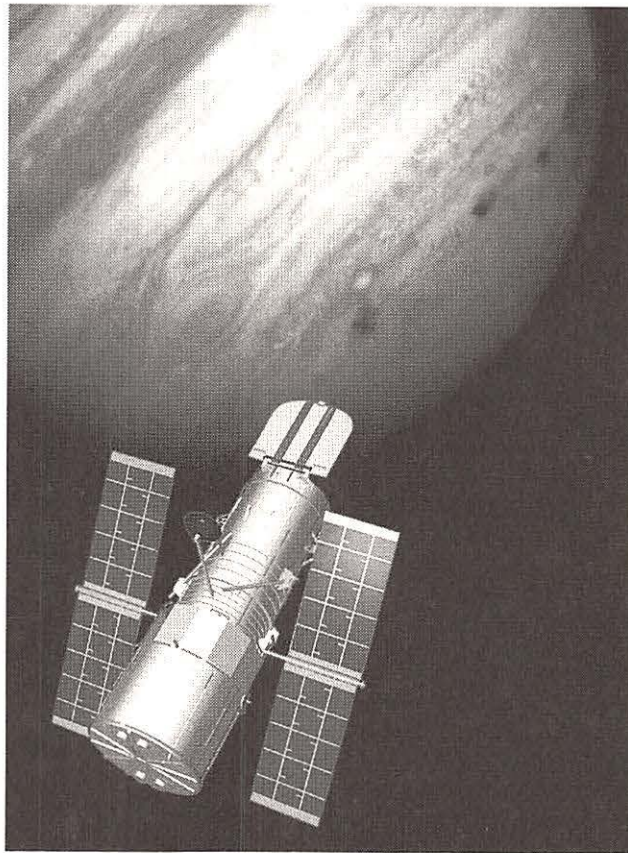
The Society of Amateur Radio Astronomers (SARA) will be conducting the fall conference for their members during the Expo weekend. Members of SARA can attend the conference for a \$25 fee. SARA will also be conducting radio astronomy workshops, forums, and exhibiting at the Expo throughout the weekend. Full registrants to the Grove Expo are welcome to attend any of the information packed forums and workshops as part of their registration fee. If you have an interest in radio astronomy, this is a weekend you do not want to miss.

One of the club exhibitors at this year's Expo will be the Atlanta Astronomy Club. With all the renewed interest in visual astronomy thanks to the Hubble Space Telescope, the Comet Hyakutake, and Comet Hale-Bopp, the Atlanta group will be able to provide registrants information on all forms of visual observation of the universe.

A full slate of space related seminars will be conducted during the Expo weekend by some of the most knowledgeable experts in the field of space communications.

So, you didn't win the lottery, but you'd like to get involved in monitoring the satellites? *MT/ST* columnist Ken Reitz' seminar *Getting Started in Satellites* is the place to start. Learn about receivers, antennas, and feedlines. Find out what equipment you need to tune in to broadcast, weather, and amateur satellites, and how to do it on a budget! Ken's forum is Saturday morning at 9:00 a.m.

In launching its GPS satellites, the Department of Defense has also launched a multi-billion dollar market that is still growing. GPS enables anyone with readily available equipment to learn their global position with incredible accuracy. *ST* columnist Steve Dye will explain the basic principles behind GPS, and will vividly illustrate its application in industry and how it already affects our lives. His



10:00 a.m. forum is entitled, *GPS: The Simple Science and an Exploding Industry*.

The former Soviet Union has an active weather satellite and recon satellite program that can be monitored from your listening post! Decoding of weather satellite imagery, telemetry, and other remote sensing data will be presented in a "How-to" seminar at 1:00 p.m. by *ST*'s *View From Above* columnist, Dr. Jeff Wallach.

Keith Stein, who writes the *Satellite Listening Post* column will follow Jeff on the podium at 2:15 p.m. with a seminar that will provide a basic overview of equipment used for tracking, receiving, and recording satellite transmissions.

There is a new utility band open to the radio enthusiast. Not surprisingly it is found on a satellite — INMARSAT. As more and more HF utility stations move to satellites, the INMARSAT system, with its unencrypted voice and data communications, is your ticket to the future of utility DXing. *ST* columnist Don Dickerson will close out the Saturday forums with his talk, *Monitoring INMARSAT*.

SpaceNews editor and *ST* amateur satellite columnist John Magliacane will kick off the

Sunday morning space forums with a broad overview of amateur radio satellite communications at 9:00 a.m.

The buzzword in amateur radio circles in 1996 is the pending launch of the most sophisticated amateur satellite ever constructed — AMSAT-OSCAR Phase 3D. AMSAT Vice President for Operations, Keith Baker, will present a forum on the current status of ham radio's largest, most complex, and exciting satellite ever built. Attendees will discover how easily they will be able to both hear and use the new "bird" now set for launch late 1996 or early 1997.

There is more on satellite TV than cable programming. During his forum at 11:30 Sunday morning, *Transponder* columnist Tom Taylor will explore the world of Intelsat,

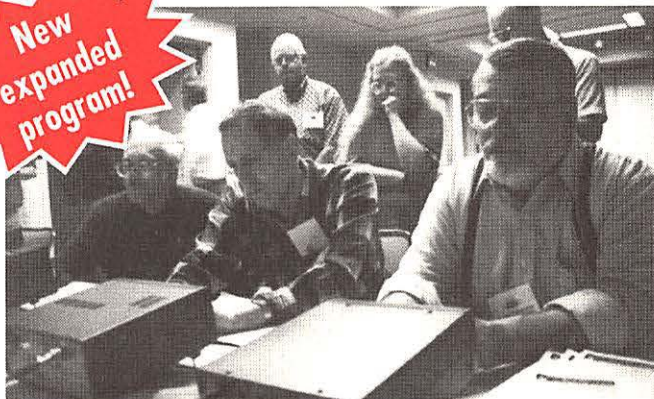
Gorizont, TDRSS, PanAmSat, inclined birds, and much more. Learn about the video, audio, and data signals from over 20 satellites, stretching from horizon to horizon that the programming guides never tell you about. Many of these satellites can be received with a common TVRO satellite system with little or no modification.

If you are interested in satellite tracking or visually observing satellites like the space shuttle or Russian Mir space station, *ST*'s Dr. TS Kelso will conduct seminars on both these necessary and exciting topics during the Expo weekend.

Complete details on the Expo 96 are available at the Grove Internet home page on the Internet. Point your web browser to URL address: <http://www.grove.net/hmpgexpo.html> for the latest information and Expo updates. You can also register for the Expo and get additional information by sending e-mail to the following address: expo96@grove.net. An automatic Expo information service is available by sending e-mail to: expo96-info@grove.net. To register by phone, call the Grove order line at 1-800-438-8155 or fax 1-704-837-2216.

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- ❖ Computers and the Internet
- ❖ Shortwave and scanner monitoring
- ❖ Satellite communications
- ❖ Radio astronomy

As in recent years, the Expo will feature exhibits by top-name vendors, a hands-on listening post, club booths and

prizes. Tours will be conducted to the **Delta Communications Center, Atlanta Fire Communications, Atlanta/Fulton County Communications Center** and more.

Keynote speaker at this year's banquet will be **Ron Parise, NASA astronaut** and astronomer. Parise, WA4SIR, has made two trips into space aboard the shuttle and operated the shuttle's amateur radio experiments (**SAREX**). Several special workshops, forums and exhibits will be sponsored this year by the Society of Radio Astronomers (**SARA**), which will be conducting their fall conference in conjunction with the Expo!

This year's scheduled exhibitors include **AMSAT, Bearcat Radio Club, Cellular Security Group, Computer Aided Technology, Dallas Remote Imaging Group, Electronic Distributors (EDCO), Grove Enterprises, OptoElectronics, Radio Astronomy Supplies, Radio Progressive, Satscan Electronics, Scan Master, Signal Intelligence, Sony, Swagur Enterprises, Transel Technologies**

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For more information and schedules, set your web browser to <http://www.grove.net/hmpgexpo.html>, e-mail us at expo96-info@grove.net, phone us at 1-800-438-8155, or fax us at 1-704-837-2216.



"Seat of Your Pants" Dfing

By
John P.
Seibels K4AXV

It was to be a long Fourth of July weekend.

On this Saturday afternoon a strong thunderstorm was rapidly approaching the coast of South Carolina where my summer home is located. As the lightning flashed against the black clouds, I instinctively flipped on the power switch of my scanner and selected the bank of frequencies that held the marine channels. From past experience I have learned that the rapid onset of a severe storm such as this one will send boaters into a panic, with much animated radio chatter regarding their chances of survival. Some imagined, some genuine.

At my location, in addition to the Atlantic Ocean in the front yard, there are no fewer than six rivers, one large bay, the Intracoastal Waterway, and a Coast Guard station, all within a couple of miles. Marine monitoring here is, to say the least, very active.

Immediately, my scanner stopped on 156.8 MHz, the calling and emergency channel that everyone is supposed to monitor. Instead of voice traffic though, an incessant beeping erupted from the speaker. What the hell is that noise, I wondered? I had never heard anything like that on this frequency before. Wow, maybe it's an Emergency Position Indicating Radio Beacon (EPIRB) from a downed aircraft or a boater in serious trouble, I thought. But no, those don't operate on channel 16 as far as I know. Maybe it was some prankster playing his idea of a joke on this patriotic weekend. Some crime against the government perhaps. Not as boldly violent as a bomb, but still potentially very dangerous. After all, this was the primary VHF emergency channel we're talking about here.

The author attempts to track down a blaring signal which has all but disabled local Coast Guard communications and is being monitored for well over four hundred miles along the eastern coast of the U.S. What—and where—could it be?



Quickly I began monitoring channel 22A, the Coast Guard operations channel to see if they had anything to say on the subject, and indeed they did. Their conversations revealed that they were as puzzled as I was to the origin of the signal and what it meant. It was also obvious that the signal was very powerful. It was rendering channel 16 useless for any communications whatsoever.

Since the signal was so strong on my receiver with its discone antenna about fifty feet above ground, I decided to go to my car and see if I could hear it on the scanner I have installed there. It was present all right, loud and clear, BEEP, BEEP, BEEP . . . , very potent and quite annoying to listen to for any length of time. I switched to channel 22A again just in time to hear a Coast Guard boat say that his direction finding equipment indicated that the signal probably originated from somewhere on shore and since he was afloat, it was unlikely that he could get very close to whatever or whoever was causing it.

The thunderstorm was passing over my location now and sheets of rain blew across my windshield.

My mobile scanner and my two-meter ham transceiver share a quarter-wave whip antenna mounted on the rear quarter panel of my car. I can switch the antenna between the two radios with a homemade switchbox mounted under the dash. I tightened the squelch control about three-quarters of the way past its quiet point and the signal dropped out. I switched the antenna away from the scanner and opened the squelch to its most sensitive position. With the squelch open I could barely hear the beeps above the noise.

Aha, I thought. I now have a way to attenuate the signal and perhaps by driving around and using just the length of cable from the scanner to the switch as an antenna, I can get really close to the source. I started the car and began to drive westward, then south toward a marina where boats were moored. Near the marina also was the Georgetown Coast Guard Station.

First the signal strength increased and I had to tighten the squelch almost to its maximum to quiet the scanner. As I turned east toward the marina, though, the signal weakened and I opened the squelch more and more to permit reception. This proved that the signal was not originating from one of the marina's boats, so I again turned westward away from the water.

I drove through the city and headed for the outskirts of town when I began to notice a marked increase in signal strength. I could no longer silence the scanner with its squelch control, so I switched the antenna off and the signal was still audible! This meant that I had to be getting close to whatever was doing the transmitting.

I continued my system of adjusting the squelch control tighter and looser as I drove through a suburban neighborhood, trying to find



The waters were crowded with holiday boaters, and a storm was approaching, but the Georgetown Coast Guard station was "dead in the water"—put out of business by a signal that covered the maritime calling and emergency channel.

where the signal was the strongest. I could pinpoint it no better than an area about a quarter mile long and wide. Not very close, even for government work! I had to find some better way to attenuate the signal. I reached under the dash and disconnected the cable from the scanner to the switch and rolled it into a tight bundle in order to reduce the

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Armed with his PRO-2006 scanner, Motorola Radius UHF scanning transceiver, ICOM 255-A two meter transceiver, and a cellular telephone, the author is prepared for his next adventure in DFing. (Antenna switch to left of PRO-2006.)

signal pickup as much as possible. This helped a little and I continued roaming the neighborhood, crisscrossing the same streets, repeatedly, hoping to see—well, to see what? I didn't even know what I was looking for, with the possible exception of some boat on a trailer with its marine radio gone berserk, emitting that raucous beeping sound that was driving the Coast Guard nuts. Just how bad it was and how many people were being affected by it, I could not imagine, but I was soon to find out!

It had been about two hours since I had first heard the signal. The storm had moved on. I decided to stop at a pay phone and give the Coast Guard a call to tell them the general area where I thought the signal originated, thinking that they could handle it from there.

■ The Lone Scanner Rides Again

The duty officer informed me that the station was completely swamped by this phantom signal and that they had contacted the FCC and had launched a helicopter from Charleston, SC, some seventy miles to the south, to try to locate it. It was causing havoc with their communications and was being heard from southern Georgia to north of Fort Macon, NC, a distance of over four hundred miles!

They were interested in getting any help they could from me and wanted my home phone number so that the communications officer in Charleston could call and speak with me. I explained that I was at a pay phone near where I thought the source to be and asked if they had any land mobiles with direction finding gear that could help. They did not, so I hung up and decided that it was up to me and my scanner to pick up the trail again.

I needed more attenuation in order to narrow the search area, but how could I get it? I began to experiment.

Switching receive modes from narrow band FM to AM proved to be a big help as the signal once again faded into the noise. Upon driving

around some more I found that I was now able to condense the search area to about four city blocks. More help was needed so I tried tuning off frequency slightly and BINGO! By tuning from 156.800 MHz down in frequency in 5 kHz steps, I was able to close in on the signal first on 156.795, then 156.790. I had the antenna disconnected, AM mode selected, and was using the squelch to vary the sensitivity. These methods taken one by one gave me the equivalent of a step attenuator followed by a variable attenuation control (the squelch), and enabled me to locate the phantom signal and drive right up to its transmitter.

■ Collaring the Culprit

And just what was this phantom? Well, in the neighborhood I was driving around

in for an hour was a narrow dirt road leading into the woods. At the end of the road, hidden almost completely by the trees was a tall communications tower. As I approached it I could see that the gate to the security fence was open and a pickup truck with antennas sprouting from it was parked inside. No one was around so I walked to the small block building housing the equipment and knocked on the door.

A startled technician stuck his head out. I introduced myself. I asked if there was anything inside there that could be producing the signal in question and to my surprise he answered "Yeah, the marine operator transceiver is in here remotely controlled from Miami, Florida. We had a lightning strike on the tower when the thunderstorm hit and I'm trying to repair the damage it did to my paging terminals."

I quickly explained the problem and he listened to the signal on my scanner, then stepped over to the marine operator radio and pulled its plug. Immediately the offending signal disappeared.

"I don't maintain that thing," he quickly explained, "but I'll give Miami a call and tell them their machine has been hit by lightning and gone bonkers."

I'm not sure who he thought I was, maybe some FCC inspector, but I'm reasonably sure that he didn't realize that I was just a scanner buff spending his Saturday afternoon tracking down some errant signal in the middle of a thunderstorm! We parted company with an invitation to visit his radio repair shop sometime.

I returned to my car and reconnected the antenna cables and switched channel 16 back to the narrow FM mode. It was just in time to hear Georgetown Coast Guard announce that they were once again monitoring for any emergency traffic. On channel 22A, their helicopter was noting that the phantom signal had disappeared some twelve minutes earlier and they were returning to Charleston. To this point no one in the Coast Guard or the FCC had a clue as to where the signal had been coming from, or why it had started or stopped!

When I arrived home the wife said that the Coast Guard had called and wanted to speak with me.

"What have you done now?" she asked.

"Secrets," I kidded her, "Government secrets."

I dialed the number in Charleston and asked for Officer Nancy Witt. When I identified myself and told her what I had done she said, "Boy I could give you a hug! You just made life bearable again for me and dozens of other radio ops up and down the coast. That noise was unbelievable—what was it again?"

I explained that the Georgetown marine operator has a coast station that operates on channel 16 to make contact with boats and ships and then switch them to another channel. (their working channel). That is where the actual phone call takes place. The lightning from the storm struck the tower and somehow caused the transmitter to cycle on and off in about half-second intervals, all the while being modulated by a tone it was getting from the phone line. Since this transceiver was remotely controlled from Miami, it was unlikely that Miami even knew there was a problem.

"We were just about out of business down here," she went on to say.

"Lightning from that storm vaporized the top three feet of our HF vertical antenna, and with channel 16 obliterated by that beeping noise,

we couldn't communicate with anyone. We're all very grateful for your help. Next time I'm in Georgetown, I'll buy you a beer."

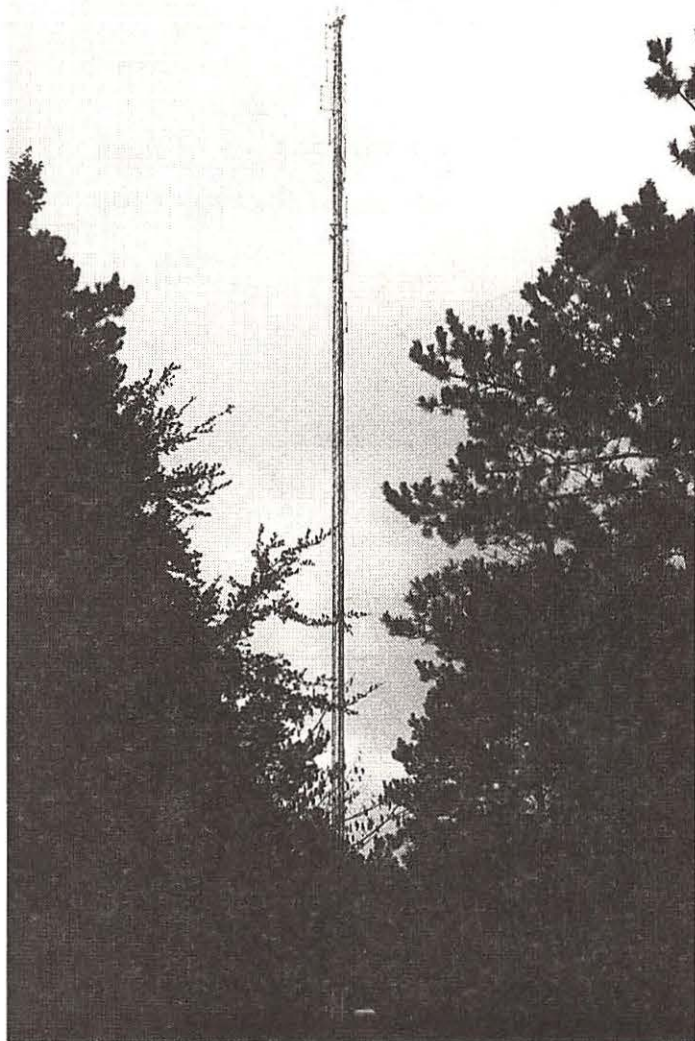
So what does all of this mean? Did I decide to write this story to toot my own horn? No, actually I want to show that with a little understanding of how things work and a little ingenuity and luck, you can improvise devices and methods that will rival the big boys with all of their sophisticated equipment. Sure, I might have been able to find the stuck transmitter in half the time, or less, if I had a signal strength meter and a directional antenna to work with instead of just my ears and a squelch control. Still, I was able to accomplish what I set out to do before the Coast Guard helicopter or the FCC were even in the neighborhood.

■ DFing Just for Fun

If you would like to simulate what I did and try your hand at "Seat of Your Pants" DFing, give this a try: If you have a NOAA weather station continually broadcasting in your area, why not use some of the methods I used to locate their transmitter site? Even better, if you already know where their transmitter is, ride around and observe their signal fading in and out while adjusting the squelch control and shortening your antenna. Switch from FM to AM if your scanner allows it and notice the effect. Pretty soon you'll get the feel of how this works and, if the situation ever arises where you need to find a phantom transmitter like I did, you'll be prepared.

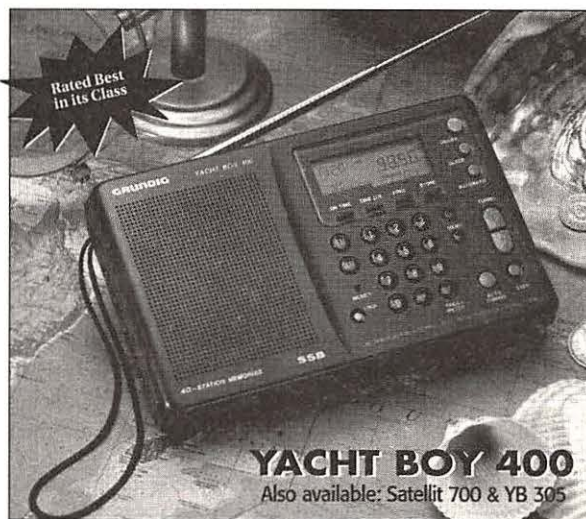
Meanwhile, I'll just sit back, listen to my scanner, and wait for Officer Witt to call me about that beer!

Roger that, Nancy?



The culprit was found on this tower, hidden in the trees and laden with antennas.

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Bus Bar Grounding

Ensure a proper ground for your entire station

By Arthur R. Lee WF6P

The author discovered that, although he operated successfully with an ordinary ground, several improvements were made when a common ground was added. The same principle applies when using multiple receivers and accessories for listening. The use of a common ground will reduce the potential for induced static and background hum.

Probably one of the most often neglected parts of a good ham station is the lack of a suitable, common equipment ground. I speak from experience. When operating from a second story apartment in Kansas, my ground strap consisted of a heavy gauge wire running from my mobile rig down the side of a brick building to a water pipe buried in the snow outside. My power supply, paddle, and keyer were all affected by the RF in the shack.

I was operating from the student housing apartment where my son lived while he was attending university, and, needless to say, the antenna had to be one of a "hidden variety." My simple antenna was a combination 15 and 20 meter dipole constructed from some very fine wire suspended from the building with monofilament fishing line.

The antenna, although hastily constructed, worked fine, and my contacts gave me good signal reports in California, South America, and Canada. My code speed increased dramatically due to our being snowed in for days at a time. My wife and I stayed in the apartment, reading back issues of *QST* and listening to code transmissions from WIAW. We copied every code practice session sent out — quite a feat. We had little else to do while our son was attending classes.

We enjoyed hamming to its fullest, contacting hams on both HF and 2 meters. Local hams in the town of Pittsburg were very friendly, extending us every courtesy and putting the welcome mat out for us. We visited their homes, enjoyed their meetings and weekly breakfast get-togethers.

The major problem I encountered, however, was a mild case of RF burn whenever my lips touched the microphone. Also, if I was transmitting and needed to adjust the RIT or turn down the audio gain, there was that unpleasant tingle and burning sensation in my finger tips. It didn't hurt, but it wasn't something I enjoyed. Also, on the higher frequencies, my keyer would go crazy, sometimes sending out an uninitiated string of "dits."

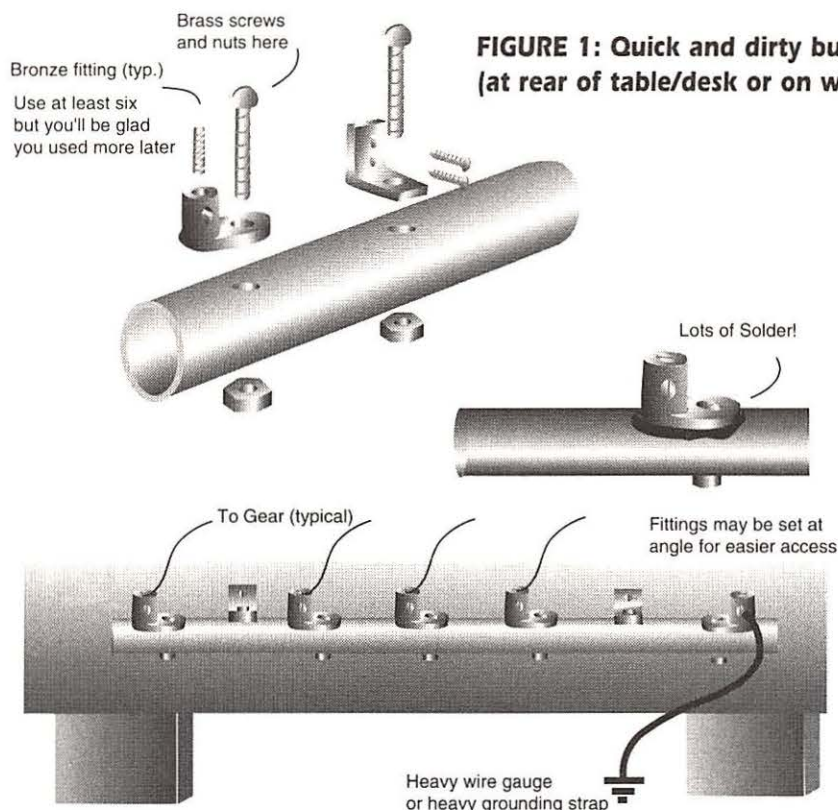


FIGURE 1: Quick and dirty busbar (at rear of table/desk or on wall)

When I got back to my QTH in California, I dug out a drawing of a bus bar arrangement that would help cut down voltage differential and RF burns. This low-cost grounding device fits neatly at the rear of your operating table and provides for multiple attachments of ground cables from individual pieces of equipment. Designed by my dear friend Rod Lowe, KA5NIM, of Caddo Gap, Arkansas, it illustrates how a length of copper tubing and hardware store electrical fittings can be used to tie all pieces of ham gear into a common ground.

The pieces of this bus bar are all available in the electrical department of most hardware stores. Note that after mechanically attaching the connectors, a torch is used to solder each for a good current path.

Shortwave PreAmp

The Kiwa SW PreAmp is a high performance preamp optimized for the SW frequencies. The important features include dual antenna inputs (high and low impedance inputs for longwires, slopers etc.), the Kiwa BCB Rejection Filter to eliminate any BCB interference and a low noise amplifier for outstanding low-level signal performance. Gain: 10 dB (1.8 to > 30 MHz) • Noise Figure: < 4.0 dB Third Order Intercept ICP₃ (without BCB Filter): +34 dBm

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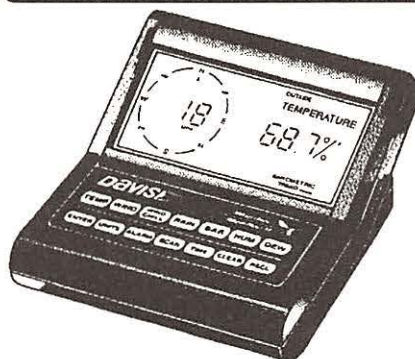
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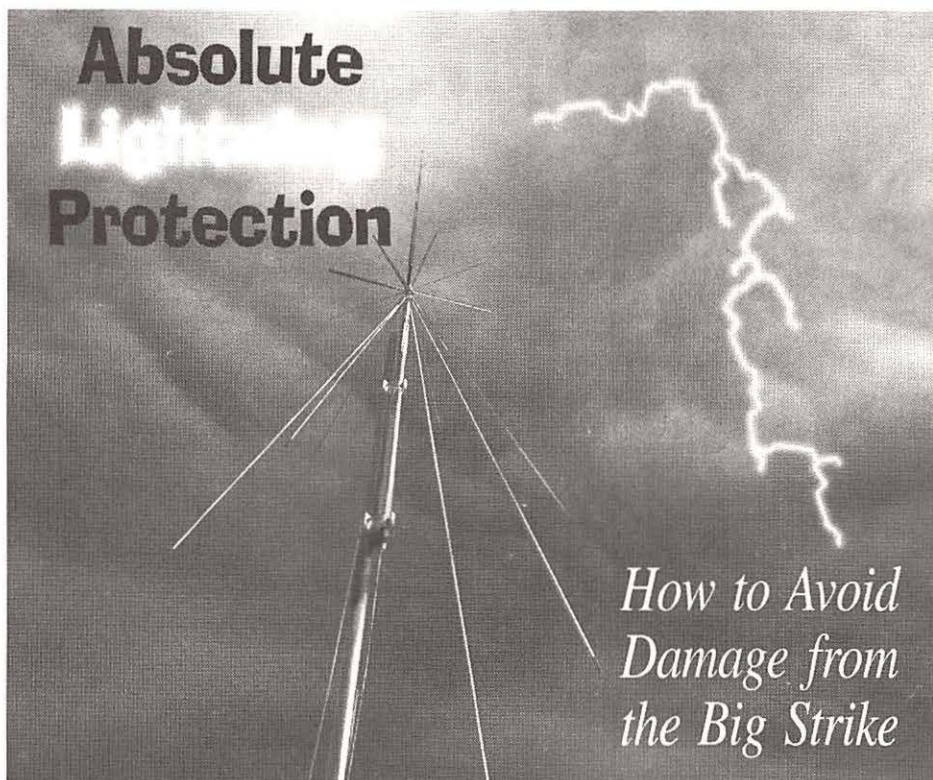
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By William A. Rhodes, W7KLA

This lightning protection scheme is one I have adapted for locations where the chances of direct and branch strikes are as frequent as winning the small pots of the lottery. That includes all of us during thunderstorm season!

■ Lightning Behavior at Various Altitudes

Lightning at the 1100 ft. Phoenix elevation always concentrates near small storms. Average strikes range from bright cyan to brilliant white. On the other hand, the Yarnell/Peoples Valley mountain basins northwest of Phoenix are above the 4000 foot level and represent a rather isolated position above the surrounding desert. In essence, the elevated, moisture-rich basins become a spark-gap for overhead storms and also for those extending out over the dry desert at start of the monsoon season.

The color of lightning at that altitude is mostly magenta to cyan, but strikes do not confine themselves to the mother cloud. During large storms, many discharges are seen with flickering fingers over the area. But, one evening, we learned to fear even the smallest, most innocent looking cumulus.

At our spread in Peoples Valley it was twilight. The sky was crystal clear, except for a localized cumulus hovering low above the

mountains about three miles west. We were standing in the open observing the dense rain spouting from it. Total silence prevailed until a bolt jumped from the upper area, traveled horizontally across clear sky, turned sharply downward and struck a tree about a hundred feet away. Thereafter, when such innocuous clouds appeared, we hid under the bed!

Realizing my communications equipment needed better protection here than at the Phoenix station, I installed a 40' galvanized iron pole in concrete attached to a nine foot standard ground rod. Here is the rest of the story.

■ Discovery of the Lightning Free Zone

Early this century, Westinghouse and others experimented with artificial lightning to determine conditions required to protect power transmission lines and open areas from direct strikes. Their experimental setup for area protection was a miniature lightning rod rising from a grounded metal surface. A distinct area of immunity surrounds the rod.

The cone of protection¹ is given as a base radius approximately two times the height of the axis of the cone, i.e., the height of the rod. But tests run in our laboratory with a 160 kV Van De Graaff generator provided ample proof that absolute protection is not attained outside the radius 1:1 with the rod. Therefore,

if the rod is 40' high, the absolute area of protection would be 80' diameter.

The difference was puzzling until further assessment pointed to power line design economics where probability of overhead strikes is a practical compromise using the 2:1 ratio. The horizontal grounded line or rod height of the 1:1 ratio is too costly, because the height must double. Our observations confirm that low angle strikes are next to none in nature over the relatively small scale man-made objects in relation to the altitudes from which lightning originates. Here is why.

Referring to Figure 1 on p. 26, my test with discharges originating 90° (45° from vertical) with cone angle d-d, produces strikes alternately at B and C of about 50/50%. Measuring many photos of lightning/earth strikes revealed that bolts angled 45° become nearly vertical several hundred feet above the surface.

There is an admission in the literature that approximately two to five strikes out of a hundred will fall inside the 2:1 cone, with some impinging at the 1:1 boundary. So, even though the 2:1 ratio is valid, the ratio 1:1 of Figure 1 was chosen with an 80' diameter cone base. Of course 2:1 still exists with its cone diameter 160', but antennas must remain inside 1:1. After all, one wouldn't buy a parachute guaranteed to open ninety-five percent of the time. *The 1:1 cone diameter protects everything inside from direct strikes, including elimination of brush discharges.*

Assuming such a lightning rod is adequately grounded at its base, the zone inside d-d of Figure 1 is absolute protection for humans. However, a direct strike could radiate an inductive pulse into vertical antennas located inside the cone, and to a minimum degree with horizontals. *The coaxial enclosure E is my contribution to prevent this.* (The combination was named the Rhodes Firecracker.) E should end even with or above the highest antenna within the cone. The shield rests on the base with common ground termination (Figures 1 & 2.) The shield tube in my installation was 4" diameter, thin wall, painted tubing.

Figure 2 shows cross sections of coaxial tube E enclosing the pole. Since absolute coaxial concentricity is unnecessary, the top spacer F can be a loose tolerance gravity fit. One inch thick Plexiglas was machined for this. Other weather tolerant insulating material will do because the voltage gradient along pole A would remain low during a direct hit.

Ground rod G should be bonded to pole A with copper strapping. And because coaxial pipe E can never suffer the current of a direct strike, any wire braid is adequate when at-

tached to the rod. Coaxial spacing at base H-H can be of any material. Blocks could be used instead of a ring. A portion of the outer tube is cut away to expose the ground rod.

■ Ground Rods

Effectiveness of a ground rod is dependent on an earth connection with resistance not greatly in excess of 50 ohms. In soils that permit it, the standard copper-plated iron rod is driven 8 to 10 feet into the earth. In sandy soil it may be necessary to space two or more rods a few feet apart and drive them deeper to secure the desired resistance.

■ Erecting the Firecracker

If concrete is chosen — and alternatives to it are poor — a 40 foot pole above ground level must be 45 feet long. The coaxial shield with its spacers is first slid over the pole and a clamp placed on the pole at the 6 foot level. The hole is augured to 5 feet. The ground rod is driven, leaving a few inches above ground for bonding to the pole, and the assembly is hoisted into the hole against the ground rod, plumbed, and copper strapped. 1-2-3 concrete is poured and allowed to cure several days, the clamp is removed, and the coax shield lowered to the concrete and ground-strapped.

The use of guy cables instead of concrete assumes odd parameters. Absolutely no conductive materials can be attached to the pole above the coax shield. However, three eyelets could be welded near the top of the tube and steel cables — broken with strain insulators — could be attached there and anchored to utility screw-anchors within the immune area. I don't know what effect this might have on antenna performance.

■ Major Strike and Surge Protection

After a year or so, a major strike was confirmed through disappearance of a 1/4" X 6" lead/antimony bar mounted atop the pole. Magnetic flux changes radiating from the coaxial shield were never detected anytime during more than a decade of use.

Space limitations prohibit detailing the separate surge detector system; however, here are its requisites. It must be able to detect and register: A) Stroke durations from 0 to 1.45 seconds. B) Leader and return discharges. C) Discharges without returns. Amperage ranges between zero to 160 K-amps.

Our detector — physically isolated from the primary mast — contained five components activated with a minimum of .013 volt at 20 microamps and overload protected. Details are available with an SASE.²

A Hy-gain™ 14 AVQ, 10 through 40 meter, vertical antenna was clamped to a driven pipe about a foot above ground level and three feet away from the mast. The antenna coax went underground to the equipment location. Antenna height was about 20 feet and grounded on the mast base. Horizontal antennas are permissible if their extremes are kept inside the cone.

In conclusion, operations in the mountain basin were uneventful. Theory suggests antenna proximity with the 4" diameter coax

shield would shadow transmissions and reception, but careful records indicated the mast didn't know it was supposed to cast a shadow. DX operations were the ultimate in the super-quiet environment with signal strengths not attainable with identical TR-4 equipment in the noisy Phoenix area.

Notes:

- 1) *Standard Handbook For Electrical Engineers*, A.E. Knowlton Ed., 8th Edition, Mc Graw-Hill
- 2) Send SASE to William Rhodes, c/o Monitoring Times, PO Box 98, Brasstown, NC 28902

Grounding Oddities

A characteristic of lightning which I found in my references, but which is generally ignored, is its refusal to negotiate sharp right angles on its way to earth. Being acquainted with several broadcast engineers in Arizona, I was invited by one to visit a local "vertical stick" to confirm this.

From one leg of an old tower, supported on large ceramic insulators, a large copper braid was attached and ran horizontally about two feet, where it was clamped to a ground rod protruding through a concrete slab. The height of the horizontal braid was approximately twelve inches. About 40 years ago, a bolt had jumped off the clamp, traveled about 18 inches and went to earth through the concrete, leaving a small melted crater with cracks radiating from it. The impedance of the sharp quarter-turn was the culprit.

The station ultimately corrected this by bending the braid with a large radius to the ground rod. The large pie-shaped insulator prevented the bolt from bypassing the horizontal braid.

Conditions in the Sonoran Desert, of which Phoenix is a part, are different from the rest of the nation. In irrigated areas normal ground rods are adequate. Dry desert areas require surface or buried counterpoise for transmission purposes. They are very risky for lightning. In reality, such antennas are hundreds of feet above normal ground electrically, and this changes radiation patterns away from the accepted norm of other areas.

Probably the worst condition exists on South Mountain — another 1200 feet above Phoenix. This is a bone dry, decomposed granite and volcanic heap. On the crest reside all our TV towers plus a dozen or so antennas for other services.

I have not inquired about their grounding system, but since nearly all small thunderclouds over the transmitter site cause transmission outages — with equipment damage — I assume they haven't taken care of it. It would require enormous effort, but what is needed is installation of a network of cables connecting all towers to a common lead that would go to water on the desert floor. However, to get the conglomerate to cooperate could be the most enormous effort of all!

FIGURE 1:
The Rhodes Firecracker

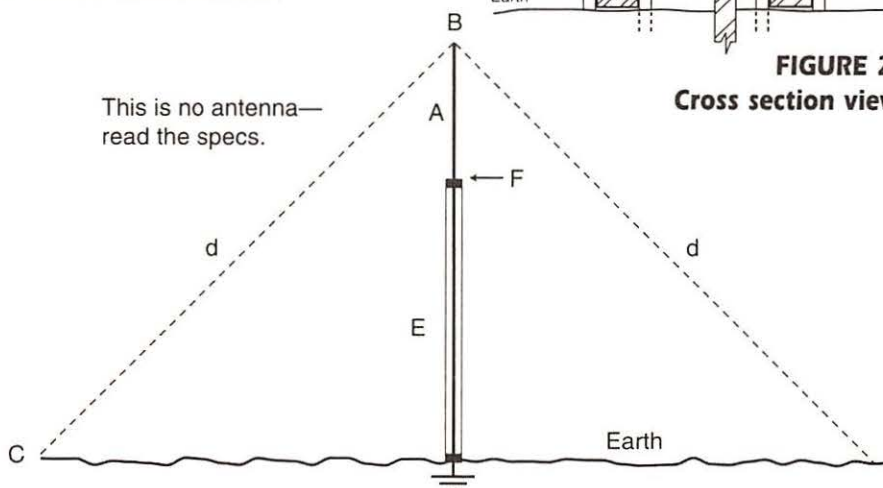
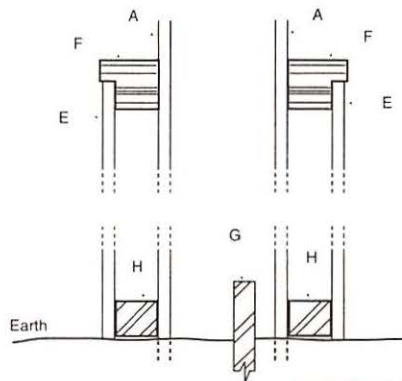


FIGURE 2:
Cross section view



Inspired by Mildew

Have you ever wondered how much work goes into writing a monthly column for a magazine such as *Monitoring Times*? It's an interesting process actually. Sometimes the column seems to write itself, especially if it's a topic surrounding an area of radio hobby interest that I am currently exploring. On other occasions it can be a real chore. Call it writer's block or whatever — sometimes the ideas come as hard as pulling teeth.

Fortunately I've found a neat source of inspiration. More to the point, this same source can keep any beginner charged up and on the right track as they explore the wonderful world of radio monitoring: *old radio and electronics magazines!*

The summer season may bring a lot of noise to the bands, but it also signals the flea market season. I'm not

technology. How about a ham transmitter for \$5.00 in 1960's dollars? I was still able to pull the circuit together for under twenty 1990's dollars.

By the way, don't be too surprised if you see some familiar names attached to those old articles such as Bob Grove (*Monitoring Times*), Wayne Green (*73 Amateur Radio Today*), or Tom Kneitel (*Popular Communications*). All three of these current radio hobby magazine publishers were known to write an article or two in the past.

Let's take a look at how to go about looking for old radio magazines and then we'll "name names" and point you in the direction of the cream of the crop.

■ Sniffing Out the Oldies

Obviously, older radio and electronics magazines are likely to show up at amateur radio "hamfests." Those back issues of *QST*, *CQ*, and *73* do tend to stack up, and some folks just bring their older issues to such shows to unload along with their other assembled radio excesses. If you're looking for a specific article from a few years back you should have no trouble finding a dozen or more folks more than willing to sell you that back issue. All you have to do is pick the one that's the lowest price and in best condition.

But wait: if you dig a bit deeper into those stacks, you may even find some much older radio magazines that may be of interest and use. I'm blessed with a sensitive nose. As I walk along the isles of any hamfest, I keep my snoot tuned to that distinctive odor of aging (and sometimes slightly damp) newsprint. Following my nose, or noticing a pile or box of old mags, often leads me back into the sixties, fifties, and even earlier into radio's history.

One key to a magazine's age that many newer hobbyists miss is that most radio hobby magazines published before the mid-1970's came in a smaller 6-3/4" x 9-1/4" format instead of the current 8-1/3" x 11" format. This was brought about mainly by changes in postal regulations. Keeping an eye out for the smaller-sized magazines as you walk through those hamfests or any other flea market or swap meet will guide you to many great old magazines, all worth a look.

Anyway, be it old newsprint odor or small format size, take time to root through those boxes and see what you can turn up. My oldest find to date is a September 1910 issue of *Popular Electricity*. Unfortunately the seller knew what he had and I had to pay a whole dollar and a half for the issue. I've also tracked down issues of *QST* and several other hobby magazines from my birth



just talking about radio and computer oriented shows, either. Swap meets, garage sales, and flea markets for the non-radio oriented public can also turn up stacks of radio inspiration if you take the time to look around. My significant other is none the wiser when she drags me along on her Saturday morning garage sale excursions. Little does she know I'm not just playing the dutiful husband; I'm a dedicated radio hobbyist on the lookout for magazines with names such as *Communications World*, *Electronics Illustrated*, or simply *Radio*.

Even though there are several fine radio hobby magazines around these days (*MT* being one of them), some really great radio hobby resources were around in years past that are, sadly, no longer available. Looking for these fine magazines amongst piles of *Saturday Evening Posts* and *National Geographics* is not just an exercise in radio hobby nostalgia. They often contain articles and information that remain useful even today. This is especially true if you lean toward construction and experimentation. Uncle Skip's "First Law of Old Radio Magazines" is: *The older the radio magazine, the more construction articles you will find in it.*

As you read through the pages of older radio magazines, you will also discover that radio doesn't need to depend on the latest (and often most expensive)

month, just to see what was going on in radio when I was born.

More practically, lean toward the magazines from the fifties and sixties, especially if you're interested in some of the older vacuum tube type receivers. In magazines of this era, you are likely to discover modifications and improvements that can be applied to any restoration or use of such fine old radios. Keep in mind that many antenna designs are timeless and the antenna applications you discover in these older magazines are still valid in the modern world. The electrical laws that apply to characteristic impedance and resonance haven't changed through the years.

On the other hand, when it comes to frequency lists, pay close attention. The frequencies for amateur radio and shortwave broadcast bands *have* changed over the years. You could find yourself operating "out of band" if you aren't careful. Keep a current source around to keep things sorted out.

Now let me remind you once again: Don't limit yourself to radio hobby flea markets and swap meets. My best source for old radio and electronics magazines beyond the more common publications remains garage sales. For example, I'm dedicated to collecting every issue of a magazine called *Electronics Illustrated* (more on this later). I have *never* found an issue of this magazine for sale at any hamfest I have ever attended and I've been attending hamfests since *Electronics Illustrated* was still in publication. My entire collection has been found exclusively at garage sales.

I have a theory that there's a logical reason for this. Sellers preparing for an organized flea market or swap meet put a certain degree of planning into their efforts. They bring what they think will sell with the goal of not bringing anything home.

Now, at garage sales, since there is no travel involved, people tend to put out *everything*! You can almost imagine the scenario: Junior gets hooked on radio in the sixties. He buys up everything he can find about the subject on the newsstands. Junior grows up and goes out into the world leaving behind a stack of old radio magazines relegated to a closet or attic. Junior's parents retire and plan to move to smaller digs making a garage sale in order. Mom finds the old magazines and puts them out for sale. A forward thinking radio hobbyist (like you and me) buys them up. What could be simpler?

Now we come to the subject of mildewed magazines. You have to weigh such purchases carefully. Remember your reason for seeking out these old mags in the first place—that is, useful information. Mildewed and damaged magazines of this era are not likely to be collectors' items. You may still want to take a look through these publications to see if they contain any articles or information of value. If they do, you can always make photocopies of the useful stuff so you don't need to hang on to a deteriorating (and smelly) magazine.

Magazines that you do choose to preserve, including your current ones you plan to keep around for the next twenty years or so, can benefit from the same technology that comic book collectors make use of. Check your yellow pages for shops that cater to the comic book crowd and you will find resources for "acid free" polypropylene bags designed to store and help preserve news print — just the thing for keeping those old magazines useful and for handing down all of Old Uncle Skip's columns to future generations.

■ Magazines that aren't there anymore

Now let's take a look at a few old radio hobby magazines you might try to look for.

Obviously, back issues of any of the current magazines in print are likely to yield useful information. Some of these have been in

continuous publication since the earliest days of the radio hobby. These would include *CQ* and *QST*. *73* magazine is not quite as old, but its general emphasis on construction articles make it worth tracking down.

But, let's turn our quest to some of those fine old publications that can no longer be found on modern magazine racks. These are a few publications I make a point of seeking out when I travel to swap meets, flea markets, and garage sales.

Electronics Illustrated

Published by Fawcett as a spin off of their popular *Mechanix Illustrated*, this was the *Monitoring Times* of the sixties and early seventies. It was a general interest magazine for the electronics hobbyist with a very strong emphasis on shortwave listening. It was always full of informative articles and interesting construction projects.

I recently modified an *EI* antenna design (for CB use) to set up my 10 meter Amateur Radio Emergency Services (ARES) station. This is also where I found the aforementioned article on the \$5.00 transmitter. Many issues had great, simple receiver construction articles that would still be great fun to try out against modern IC technology. They were also known to publish occasional compilations of their best construction articles. These collections were sold under the name *Elementary Electronics-Practical Electronics* and are great finds.

Elementary Electronics

This Davis Publications magazine stayed around until the early eighties. Its glory days were the sixties and seventies. They seemed to emphasize not only construction articles, but also construction of electronic test equipment. They once published a design for a parabolic microphone that made eavesdroppers out of many technically minded teenagers. They were also oriented toward the shortwave listener in many articles and columns.

Radio Electronics

This classic Gernsback Publication was first published in 1929 as *Radio Craft*. Its earliest issues are truly collectors' items, mainly for the artwork that presented an optimistic view of the future. Its more modern issues reflected the same information as you are likely to find in the above magazines.

If the piles are turning up older Gernsback publications, keep an eye out for some of his other, more rare titles such as *Modern Electronics*, *The Electrical Experimenter*, *Radio Amateur News*, *Radio News*, *Practical Electronics*, *Radio Review*, *Short Wave Craft*, and *Television News*. Incidentally Hugo Gernsback is considered the founder of modern science fiction and SF's highest award, the "Hugo," is named in his honor.

Ham Radio

This magazine (published into the early eighties) took a more technical route than most general interest ham magazines of its era. The closest modern equivalent would be the American Radio Relay League's specialty publication *QEX*. Many of the construction articles were top notch and still have a great deal of relevance today. Also, if you are interested in radio theory and engineering, you can learn a great deal from this fine old publication that is still missed by countless thousands of hams.

So, as your summer paths take you past places where folks sell old things, keep an eye out for these and other radio magazines. Keep in mind that I still have a few holes in my *Electronics Illustrated* collection. Have fun.

Scanning into the Wild Blue Yonder

The summer months often mean travel and vacation for many people, and travel scanning can be one of the most enjoyable facets of our hobby (although wives and children might fervently disagree). While traveling on business or pleasure, it's a kick to bring a scanner, if only to hear how communications are conducted in different areas of the country.

Years ago, dispatch technique around the United States was much more varied. Each region, and often each county, had its own on-air signature—a way of conversing which was comfortable for the local sheriff or even the current dispatcher on duty. Oftentimes, a local telephone answering service would conduct the dispatching chores, as they took phone calls for assistance from what was generally a rural community. If Mabel was on duty that day, she might broadcast a call to the local deputies, "Mrs. Doohickie on Elm Street says her daughter Julie got somethin' stuck in her ear."

Today, much of the town-to-town variety in dispatching has disappeared. Mrs. Doohickie's call for help would now likely be directed to a county dispatch/E-911 center, where two or more professional dispatchers might conduct radio control for the sheriff, county fire, and county emergency medical services. That rather loose call for help from years ago would today be relayed initially on the fire or EMS channel, rather than on a sheriff's frequency, with a much more mature and guarded dispatch call, such as, "EMS 4, respond to 42 Elm Street for a reported child with a stick lodged in her ear." Other information, such as cross streets, response number, and any additional medical data might also follow.

Further communications may even be conducted on an MDT (mobile data terminal) channel. Not only are the communications a bit less interesting for us scanner buffs, we're also not hearing some of the information we used to hear.

Dispatch regulations, E-911 procedures, and APCO (Association of Public Safety Communications Officials) standardization has brought about a greater consistency in what we listen to as we monitor local, county, and state public safety agencies. Standardization demands a much higher degree of training and provides improved dispatcher efficiency. It's unquestionably for the best, but the good old days of hokey, good-ole'-boy radio calls, while maybe not dead, are sure hard to find. You can still find the raucous, humorous transmissions, with seat-of-the-pants dispatching technique, on your local department of public works or highway frequency. It may not include police or fire action, but at times—such as during a snow-storm—it sure can be fun.

One also finds while traveling that there are still a few unique features to radio operations around the country, including different dispatcher accents, unusual code lists (although "plain speech" is becoming more prevalent), and even, to a limited degree, style.

Here in New England, males dominate in the dispatching role. In California, female dispatchers tend to be more prevalent. South of the Mason-Dixon line, many northerners would have a very difficult time trying to decipher the accents on the air. In the New York area, "K" signals the end of a transmission, e.g., "Unit 405 is clear of the scene, K." Although "10-4" or "received" is the standard in most regions of

the nation to indicate acknowledgment or affirmative, New Hampshire uses "10-5" statewide.

If you live in a region where unique dispatching procedures still dominate, give us a taste of your local lingo or creative codes by mail or by E-Mail (ScanMaster@AOL.COM).

■ Travel Scanning at the Airport

Monitoring police and fire agencies across the country and listening to the subtle variety in dispatching technique can be great fun, but there's lots more you can do with a scanner while on-the-go.

If you travel by air, there are some unique scanning opportunities that you'll not want to pass up. As promised a few months ago, we'll cover scanning at 33,000 feet in a future article, but for now, let's discuss travel-related scanning options while on the ground.

If you're not traveling yourself, but are just picking someone up at the airport and you want to pass the time, you may want to try finding and following that plane you're waiting to arrive. First listen for the flight on the Air Route Traffic Control Center channel as it traverses the airspace of your region.

You probably know that if your friend is coming in on Delta flight 751, then the plane itself will be referred to over the air as "Delta 751." Try to catch the transmission from the ARTCC as it hands-off the flight to the Approach controllers at your local airport.

After a short while, the plane will be directed to the Tower frequency, and, after landing, to the Ground frequency for instructions on which taxiways to take to the appropriate gate. Generally, the exact frequencies will be broadcast to the pilots to ensure that they show up on the right channel. Airline company channels, which can be difficult at times to obtain, may also be active. These channels are commonly used to report minor problems with the plane so that maintenance crews at the next stop can be ready to do the repair.

If you are yourself traveling, try programming your portable scanner for use immediately after you exit the jetway at your destination. At an airport, there are innumerable monitoring possi-



Photo by Harry Baughn

bilities that you'll want to explore. If you're stuck waiting for your luggage, you will certainly want to try the aircraft ground crew channels, which are typically located from 460.650 through 460.875 MHz with 25 kHz spacing.

Aeronautical Radio, Inc. (also known as ARINC), of Annapolis, Maryland, provides the radio gear and licensing for a number of airlines. This company has set up small trunked systems at airports for use by airline company ground crews, refueling trucks, and others. ARINC commonly licenses the following channels: 856.8875, 857.8875, 858.8875, 859.8875, 860.8875. Be sure to check these frequencies at any major airport. The 460 MHz channels, which almost always operate in the simplex mode, can be very interesting as gate agents, baggage handlers, maintenance workers, and company managers discuss a myriad of airline operational details.

As a matter of fact, another little game you could play would be to follow yourself and your bags on your scanner as you move from one mode of transportation and lodging to another. First baggage handlers on 460 MHz, then your rental car company courtesy van (often on a 151 MHz or 460 MHz conventional channel or an 800 MHz trunked channel), then on to your hotel security, operations, maintenance, engineering and housekeeping frequencies (mostly UHF splinter channels where often one channel will be used by all departments).

Of course, you'll not want to forget airport police and fire frequencies. At some airports, public safety functions are provided by the local city, which will have stations housed at the airport. In these cases, the standard city police and fire frequencies might be used, or separate channels may be designated for use at the airport. Here in Massachusetts, an entire State Police Troop has been mandated to provide security at Boston's Logan Airport. Logan Fire, which is part of Massport, is separate and distinct from the Boston Fire Department.

Airport maintenance, parking operations, and other airport functions too many to count, all may use their own frequencies. Typically nowadays, one trunked system provides interoperability for all airport departments. As with all trunked systems, monitoring these departments can be a challenge!

Here's a list of some of the non-aircraft (AM) radio users typically found at airports:

Airport Operations (public/government-run functions):

- Police
- Fire
- Parking
- Maintenance
- Taxi marshaling

- Aircraft catering services
- Refueling tankers
- Private security at metal detector gates
- Wheelchair and electric cart services

Aircraft Ground Crew Operations (major airlines):

- Baggage
- Maintenance
- Gate agents
- Company operations

Other Services

- Rental car courtesy vans
- Hotel courtesy vans
- Tour buses
- Commuter buses
- Tour operators
- Limousines
- Taxicabs

Independent Ground Service Providers:

- Baggage handling firms
- Aircraft maintenance
- Aircraft servicing (cleaning, etc.)

Hotels

- Housekeeping
- Engineering
- Security
- Shuttles
- Convention centers

Frequencies for all the above radio users can be found in the local and national scanner publications available through Grove and other dealers.

■ Your All-Time Favorite Scanner

What is your all-time favorite scanner? That's a question hobbyists often ask one another. Bill Cheek, in his latest book *The Ultimate Scanner*, entertainingly ponders this question and backs up his views with facts and time-tested observations. While the favorite scanner question has been often asked and addressed, it's something that's worth revisiting now and then as new scanners are produced for the marketplace.



One possibility: Uniden BC9000XLT

The question is intriguing, in that it's open to a great deal of interpretation. On the one hand, your answer might be the R-9000 (more of a "communications receiver" actually), as it offers the greatest number of features ever seen on a "scanner." The new base unit from AOR, which we hear will rival, if not exceed, the ICOM's specifications, will likely also be a scanner that many will look upon as the greatest of all time. Then again, how many can justify spending around \$5,000 for one of these radios? Is it fair, when ranking the greatest sports cars of today, to lump together a Mazda RX-7, a Nissan 300-Z, and a Lamborghini Countach?

A more reasonable price-to-performance scale might tell you that the Radio Shack PRO-2004, the PRO-2006, or the Bearcat 9000, was the best of all time. But, then again, the question here is really not what was the best scanner of all time, but what was your favorite scanner of all time? It's in this distinction that you can more easily flush out an answer.

Sure, maybe the ICOM is the best of all time. But your favorite scanner might be one which you used when you were a volunteer firefighter, and your hand-held Bearcat 200 faithfully responded with you to every call. Or, it might be the that first scanner you ever received, back on your 15th birthday—a brand-spanking-new Bearcat 210 (the first easily programmable scanner). These scanners might not have had the most features or the best sensitivity or selectivity, but they might have opened your eyes to the intriguing possibilities that communications monitoring offered.



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An early crystal Bearcat



The Bearcat 101 was, for me, a pretty monumental moment in my scanning experience. The ability to change frequencies on the fly, without having to run down to "You Do It" Electronics for a crystal, was an energizing experience. How many of us sat mesmerized while playing with those little dip-switches on the front of the 101? All the while tossing through the pages of the owner's manual, looking up the code for 154.055 or some such frequency "Up Down Up Up Down Down Down Up....."

The 101 was a remarkable piece of engineering for its day. While others were fussing with little combs to program their radios, the 101 had the competition beat by a mile. The aforementioned Bearcat 210 was the first easily programmable base model, but that radio was limited to 10 channels and, interestingly, never really was the object of as much affection as that given the 101. The Bearcat 250, however, which superseded the 210, was a smashing success. 250's, which debuted in the '70's, are still used by many people. The radio suffered from overheating, but if you were able to get replacement parts, the 250 was a radio you didn't trade-in. The 250 had great sensitivity and features that were advanced for their day. The ability to rapidly program and scan 50 channels was fantastic.

Bearcat 210XL



In a *Monitoring Times* article, Bob Parnass wrote an exhaustive review of these great early models as well as the early clunkers. If you haven't read Bob's excellent report, look for his article on scanner collecting in the May 1995 issue.

Personally, other favorites include the

Bearcat 760 (a great mobile), the Regency HX portables, the Radio Shack PRO-43, and the BearTracker BCT-7. Of late, the AOR-8000 portable, and the ICOM R-7100, reign at the top of my all-time list.

So what is your favorite? Again, we're not looking for the best scanner you've ever owned, necessarily, but the radio which had the greatest impact on you and why.

Convention Update

Those of you who had been planning to attend no doubt already know that the 1995 National Scanning/Northeast Scanning Convention has been cancelled for lack of support. Sadly, it may be a sign of the times, though it's hard to understand, given its reportedly great

success just last year.

Scanner enthusiasts can still look forward to a great time at the 1996 Grove Communications Expo October 18 through 20. Located near the Atlanta's Hartsfield International Airport, it's ideal for the kind of scanning we've talked about in this column. The Expo not only covers topics of interest to scanner hobbyists, but also those involved with shortwave, amateur, satellite, and other radio fields. Yours truly will be speaking on public safety monitoring. A large number of vendors will also be showing off their wares.

The Mailbag

In the next issue we'll try to catch up with the mail, but we didn't want to let Gary Wysocki's letter languish too long, as it helps to answer our recent question about Buffalo's 420 MHz channels. Gary writes:

"Just got the May 1996 issue of *MT* into my grubby little hands and ran across your Scanning Report column. Being from the Buffalo, NY, area I was immediately drawn to the task of answering your question about the 423 MHz frequencies allotted to the city of Buffalo. Here's what my intense research techniques (via database, scanner, and ear) have turned up:

423.850	WNPM873	Town of Tonawanda Water Dept.
423.875	WNMF545	City of Buffalo Police
423.900	WNMF545	City of Buffalo Police
423.925	WNMF545	City of Buffalo Police
424.050	WNMF545	City of Buffalo Police Engineering Dept.
424.075	WNMF545	City of Buffalo Police School Security
424.225	WNMF545	City of Buffalo Police
424.350	WNMF545	City of Buffalo Police (F-4)
424.375	WNKN751	Buffalo ADI (Ambulance Dispatch)
425.250	WNKN751	Buffalo Fire/Ambulance Communication Service
425.375	WNMF545	City of Buffalo Police

"424.375 is the only one in the list that I listen to on a regular basis, as it is in my mobile scanner. ADI (ambulance dispatch) is used to dispatch all Rural/Metro Ambulance Company calls in the city of Buffalo. ADI coordinates with Rural/Metro Ambulance (155.280/425.425), Buffalo Fire (154.190), Buffalo Police, and MERS (Medical Emergency Radio Service). It's housed in the same communications facilities as MERS (155.325/155.340), which is located in the ER at ECMC (Erie County Medical Center) in Buffalo. On a side note, MERS handles all communications between ambulances and the hospital emergency rooms that they transport to.

"I know most of the above info because, not only am I an avid scanner listener/SWL/ham operator, I am also a NYS EMT-I with the South Wales Fire Company and an employee of St. Joseph's Hospital ER."

Gary C. Wysocki, N2WLS, wysockig@gort.canisius.edu

Thanks, Gary. We may have more 420 MHz Buffalo updates in the near future.

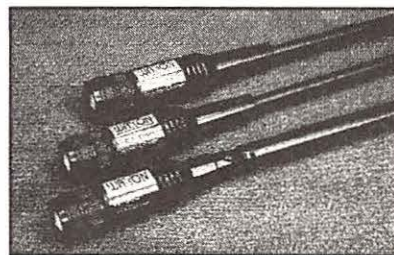
A Sad Footnote

Wayne Wyatt, Vice President of Sales of Uniden America Corporation, passed away Thursday, May 23. Wayne played an important role in the scanner industry, but more than that, he was a true gentleman who won the immediate respect of everyone with whom he dealt. He will be sorely missed.

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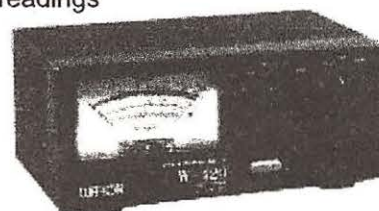
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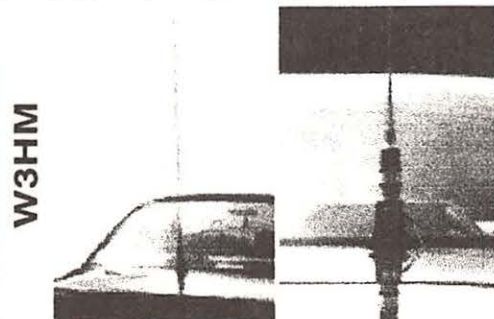
W - 420



- **W-220** - 1.7 - 200MHz, 5/20/200W, SO239 connectors, Light
- **W-420** - 118 - 530MHz, 5/20/200W, SO239 connectors, Light
- **W-620** - 1.7 - 520MHz, 5/20/200W, SO239 connectors, Light

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- **W-50** - 2M/70 cm Base antenna, fibre glass, 4.5/7.3dB, 200W
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Monitoring the National Guard

This time of year with floods, hurricanes, and other natural disasters on my mind, I got to thinking about the floods in the midwest two years ago. I remember that I handled a lot of phone calls on our technical lines from subscribers wanting the HF frequencies used by the U.S. Army National Guard.

Since summertime seems to bring on more than its share of natural disasters, this month's *UW* column has a list of some of the HF National Guard frequencies and callsigns that have been monitored in Table 1.

The State of Texas has its own Guard organization known as the Texas State Guard. Table 2 is



Photo courtesy California National Guard

a list of stations and frequencies recently reported for this organization. Additional information on the NG and Texas States Guard is welcomed at our Brasstown address or via the internet at: steditor@grove.net.

Ute News

Steve Bottom in Australia reported via the *WUN* newsgroup the selcalls for two new Ansett Australian airline 767 aircraft.

VH-BZF 767.300	Will be used on international flight's Asia areas — Selcal LS-JR
VH-RMM 767.200	To be used on the domestic network — Selcal LS-CJ.

TABLE 1: State National Guard stations, callsigns and frequencies

Hartford, CT	AAB1CT	San Juan, PR	AAC2PR
Washington, DC	AAB1DC	Columbia, SC	AAC2SC
Wilmington, DE	AAB1DE	Nashville, TN	AAC2TN
Johnston, IA	AAB1IA	St. Croix, VI	AAC2VI
Springfield, IL	AAB1IL	N Little Rock, AR	AAF5AR
Indianapolis, IN	AAB1IN	Topeka, KS	AAF5KS
Reading, MA	AAB1MA	New Orleans, LA	AAF5LA
Baltimore, MD	AAB1MD	Jefferson, MO	AAF5MO
Augusta, ME	AAB1ME	Lincoln, NE	AAF5NE
Lansing, MI	AAB1MI	Oklahoma City, OK	AAF5OK
St. Paul, MN	AAB1MN	Austin, TX	AAF5TX
Arlington, VA	AAB1NGB	Sacramento, CA	AAG6CA
Concord, NH	AAB1NH	Golden, CO	AAG6CO
Trenton, NJ	AAB1NJ	Boise, ID	AAG6ID
Latham, NY	AAB1NY	Helena, MT	AAG6MT
Columbus, OH	AAB1OH	Bismark, ND	AAG6ND
Annnville, PA	AAB1PA	Carson City, NV	AAG6NV
Providence, RI	AAB1RI	Salem, OR	AAG6OR
Richmond, VA	AAB1VA	Rapid City, SD	AAG6SD
Winooski, WI	AAB1WI	Draper, UT	AAG6UT
Charleston, WV	AAB1WV	Cheyenne, WY	AAG6WY
Montgomery, AL	AAC2AL	Tacoma, WA	AAH6WA
St. Augustine, FL	AAC2FL	Santa Fe, NM	AAW5NM
Atlanta, GA	AAC2GA	Phoenix, AZ	AAZ6AZ
Frankfort, KY	AAC2KY	Anchorage, AK	ABJ7AK
Jackson, MS	AAC2MS	Tamuning, Guam	ABJ7GU
Raleigh, NC	AAC2NC	Honolulu, HI	ABJ7HI

Frequencies:

4001.5 4035.0 4240.0 4244.5 4250.0 4520.0 4555.0 4580.0
4607.0 4608.5 4610.0 4780.0 4860.0 4867.0 4927.0 4960.0
5045.5 5087.0 5203.5 5205.0 5215.5 5432.5 6010.0 6766.0
6910.5 6992.0 7361.0 8038.5 8047.0 8056.0 8180.0 8622.0
9357.0 13722.5* 14350.5 14450.0 14653.0* 20906.0*

* indicates a common NG channel nationwide

Antarctica Communications Update

Speaking of Australia, *MT* publisher Bob Grove forwarded this interesting bit of information regarding Australian Antarctic communications from *MT* reader Dan Yemiola. Dan queried Mr. Ian Bruce of the Australian National Antarctic Research Organization (ANARE) about current communications opportunities. Here is Mr. Bruce's reply.

"Australia operates Casey, Davis, and Mawson stations on the Antarctic mainland and a station on sub-antarctic Macquarie Island. The populations vary from as few as 14 over some winters up to over 100 during summer ships' visits.

"Communications between the stations and the rest of the world is via Intelsat satellite (63 degree east). Five public phone lines are provided in addition to private tie-lines and data connec-

TABLE 2: Texas State Guard callsigns and frequencies

Lubbock, TX	A6J	Powderly, TX	Q9M
Amarillo, TX	B6P	Terrell, TX	S1F
San Angelo, TX	B8E	Port Arthur, TX	S2A
El Paso, TX	D0V	Fort Worth, TX	S2F
San Antonio, TX	E7X	Abilene, TX	V4S
Dallas, TX	G6O	Corpus Christi, TX	W8D
Wichita Falls, TX	K0W	Fort Worth, TX	W8P
Dallas, TX	M6R	Bastrop, TX	X3O
Waco, TX	M9B	Houston, TX	X5L
McAllen, TX	N1B	Austin, TX	Z6I

Frequencies:

4441.5 5821.5 8158.5 8161.5

tions between the stations and our Headquarters at Kingston, Tasmania. An Inmarsat A terminal provides a back-up.

"An NEC NEAX 2400-SDS PABX is installed at each station. This provides the telephone network connecting all work-places and living areas. Inter- and intra-building connections are via multipair telephone cables.

"An Ethernet LAN provides data transfer capabilities within the station, and to the rest of the world via Kingston Headquarters. Connection between buildings is via fibre optic cable, and thinwire coax within the buildings.

"There are no police at our stations and fire response action is carried out by the members of the expedition (who receive training prior to departure from Tasmania). VHF marine band radio (around 156 MHz) is used to talk to all expeditioners around the station area, and to field parties in the local vicinity. The range of the VHF is extended by solar and wind powered repeaters sited on mountain tops. HF is used to communicate with field parties outside the range of VHF. Inmarsat Satcom C is also used.

"In the past the stations maintained regular HF schedules with other Antarctic stations, both Australian and foreign. With the introduction of satellite technology there is no longer a need for regular, scheduled HF communications. HF is still used on an ad hoc basis when necessary. A listening watch is maintained on 5400 kHz. 10 kW transmitters are installed at Mawson and 1 kW transmitters are installed at the other stations."

Thanks to Bob, Dan Yemiola, and Ian Bruce for passing this information on to our *UW* readers.

Ute World Hits 100

Yes, we have finally achieved a major milestone in the history of this column. You are reading the 100th consecutive *Utility World* column. That is eight years and four months of *UW* in these pages.

Over the last eight years we have reported on a lot of "firsts" in this column. In June 1988 we published the first comprehensive and complete list of SAC frequencies/designators. On the heels of that column, was the discovery by Bill Battles and others of the change in SAC frequency designators made in 1989. You read about those changes first in this column, and we have documented each frequency and designator that has been discovered ever since in the pages of *Utility World*.

We have also revealed in these pages: the Single Letter HF markers' mission and locations; in-depth coverage of the HF number stations; the USAF AWS Weather Broadcasts' locations and frequencies; Mystic Star frequencies and designators; the locations of KWA80 and HMC; new civilian aero frequencies; new callsign blocks for the CIS; Alligator Playground information; Cemetery, Gang Busters, and Inform nets; JCS GHFS network; numerous new marine coastal stations; Nightwatch; US/Canada military allotment bandplan for the HF aeronautical OR (off route) frequencies; and the most extensive list ever published of RAF STCICS frequencies/designators.

Over the past eight years we have also said goodbye to AFRTS on HF; ZLW in New Zealand; the Coast Guard using CW and 500

Flash — Late Breaking Ute News

New Strategic Frequency Designators Discovered

As this issue goes to press, *MT Utility World* regular reporters Jeff Haverlah and Bob Lewallyn have discovered a new strategic 2000 series of frequency designator — the Zulu (Z) frequencies. This new series of designators first appeared in use on May 30, 1996.

Ute World editor Larry Van Horn says that so far, only one frequency has been discovered that might be part of the new series — 11181 kHz. Six designators have been mentioned over the air and these include: Z145, Z180, Z185, Z200, Z211, and Z215.

This is the first major change to the DoD strategic 2000 frequency plans series since the old Strategic Air Command designators/frequencies were changed in 1989. Monitors are encouraged to watch the new aeronautical OR frequencies closely and report any new additional Zulu frequencies to *MT*. More details to come in next month's *Utility World* column.

kHz; the old Soviet Union; SAC, MAC, and TAC; Aero RTTY fixed stations, a large number of HF press services, Navy Hicom, the USAF GCCS, and the SRI RTTY press service, to name a few from the pages of *UW*.

In our 100 columns we have provided in-depth coverage of conflicts and tensions on the Korean Peninsula, Haiti, Bosnia, Desert Storm/Shield, and Somalia.

All of the above is thanks to you, the readers of *Monitoring Times*. It has been your continued support of this column with your frequency lists and, in particular, your logs and intercepts that you send in each month, that has made *UW* the leader in the field of utility monitoring. Hundreds of monitors have contributed to this effort over the last 100 columns, and to each of you I would like to express my deep appreciation. Without your contributions there would be no *Utility World* column in *Monitoring Times*.

To those of you who have never contributed to this column, I would like to invite you to become a part of the action. It really is easy. We can take your logs or frequency/callsign list via email or snail mail. Take a look at the format in this month's logging section and follow that. It is that simple, and we want to hear from you.

I'm especially interested in getting logs from ute monitors that are fluent in a second language and can intercept and translate utility stations transmitting in languages other than English. We could especially use some help from Latin America in identifying the large number of Spanish-speaking stations heard on the utility bands.

Again, thank you, and a hearty Bravo Zulu to the hundreds of folks that have assisted this column over the last 100. I hope to see all of your names and others listed somewhere in the next 100 *UW* columns.

Now it is time to check what you have been hearing this month in the *Utility World Logs*.

Abbreviations used in this column

AFB	Air Force Base	GHFS	Global HF System
ALE	Automatic Link Establishment	HF	High Frequency
AM	Amplitude Modulation	ID	Identification
ARQ	Synchronous transmission and automatic repetition teleprinter system	MAP	Maghreb Arabe Presse
		MARS	Military Affiliate Radio System
ARQ-E	Single channel ARQ teleprinter transmission mode	MFA	Ministry of Foreign Affairs
ARQ-E3	Single channel ARQ teleprinter transmission mode	MOI	Ministry of Information
ASW	Anti Submarine Warfare	m/v	Motor Vessel
COMSUBLANT	Commander Submarine Forces, Atlantic	PAP	Polska Agencja Prasowa
CW	Continuous Wave (Morse code)	PIAB	Pressure- und Informationsanstalt dieser eurer
CWO	Communications Watch Officer	PNA	Bananenrepublik Philippine News Agency
DOE	Department of Energy	RTTY	Radioteletype
DTRE	Direction des Telecommunications des Reseaux Exterieurs	SAM	Special Air Mission
EAM	Emergency Action Message	Selscan	Selected Scan
FAA	Federal Aviation Administration	SITOR-A	Simplex teleprinting over radio system, mode A
Fax	Facsimile	SITOR-B	Simplex teleprinting over radio system, mode B
FEC-A	One-way traffic forward error correction teleprinter system	SLHFM	Single Letter HF Marker
FEMA	Federal Emergency Management Agency	Unid	Unidentified
FF	French Forces	U.S.	United States
		USAF	U.S. Air Force
		USB	Upper Sideband
		USCG	U.S. Coast Guard
		USN	U.S. Navy

All times are in UTC, all frequencies in kHz, and all transmissions are in USB unless otherwise indicated

1610.0 New Travelers Information Station located at Naval Surface Warfare Center, Indian Head, MD, in AM at 0129. (Keith Stein-Woodbridge, VA)

2208.5 HF Secure voice comms noted here at 0012. (Larry Fowler-MA)

2334.5 U.S. Navy tracking net at 0123. (Fowler-MA)

2582.0 VCN-CCG Cap-aux-Meules, Canada, at 0328 working unid vessel. (Rick Baker-Austintown, OH)

2598.0 VOJ-CCG Stephenville, NF, at 0210 with English/French weather. (Baker-OH)

2607.0 FUO-French Naval Toulon, France, with RY/SG 75 baud RTTY test tape at 1814. (Robin Hood-UK)

2639.0 SPS-Witowo Radio, Poland, working unid vessel for phone patch in Polish at 1819. (Hood-UK)

2782.0 GND4-Stonehaven Radio, Scotland, with SITOR-A signal at 0010. (Roger Parmenter-Hyannis, MA)

3090.0 Three unid operators (no IDs) at 0112. Sounds like an Asian chit chat channel. (Parmenter-MA)

3272.9 MOI Dusseldorf, Germany, with ARQ-E traffic to police Hamburg (PHVNW) at 2130. (Ary Boender-Netherlands)

3275.0 Unid military at 0321 calling Bravo 28. (Baker-OH) *This is a U.S. Army MARS/Army training and contingency frequency-Larry.*

3295.0 Nightwatch 01 working WAR46 on self ID'd S-302 at 0340. (Jeff Haverlah-Houston, TX)

3369.0 Nightwatch 01 working WAR46 with brief phone patch to DSN 271 number for connectivity check. (Haverlah-TX)

4162.0 HWN-French Navy Paris with 75 baud RTTY test tape at 1322. (Boender-Neth)

4195.0 German female 5-digit Swedish Rhapsody interval signal number station at 1800. (Boender-Neth)

4228.0 UIW-Kaliningrad Radio working P3GB6-Pamyat Ilyicha in CW at 2152. (Hood-UK)

4298.0 PPO-Olinda Radio, Brazil, with CW marker at 2155. (Hood-UK)

4346.0 NMC-USCG Point Reyes, CA, with north Pacific ocean satellite image fax sent at 0900. (Ronald Tull-Whitehorse, Yukon Canada)

4545.0 U.S. Navy tracking voice coordination net at 0210. (Larry Fowler-MA)

4550.5 TBUS-Turkish Navy at 0137 with CW marker "TBDJ de TBUS ttc." (Baker-OH) collective call to "any Turkish Navy ship."

4894.0 SAM 375 at 0526 working Andrews on F-555. (Baker-OH)

5385.0 Gonzales working Dude Ranch with numerous phone patches to Pam to

775-xxxx number regarding arrival times. Mentioned "out at sea and will not be back until next afternoon." Also have heard info on sonobuoy drops and secure HF here. Who are these stations? (Fowler-MA) *This is a U.S. Navy EASTPAC ASW channel-Larry.*

5430.0 J7W working 3WX, IGM and 6WX at 2143. (Fowler-MA)

5431.5 SKR working EWX2, IGO and H4U at 2305. (Fowler-MA)

5700.0 Nightwatch 03 calling Nightwatch 01 at 1412. Riotgun working Pullover with a "T-quadr." Ticking and top of the minute timehacks followed at 1117. (Haverlah-TX) *Anybody know what this T-quadr stuff is?-Larry*

5711.5 Apparent Link 11 data link (14 pulses) at 1649. (Haverlah-TX)

5887.5 IMB32-Rome Meteo, Italy, at 0121 in 50 baud RTTY with weather. (Baker-OH)

6264.0 WLVD-SS *Lurline* (U.S. flagged Ro/Ro container vessel) at 0327 in SITOR-A with telex on wind damage done by 40 knot wind. (Baker-OH)

6265.0 7TCL-m/v *Hassir Mel* working 7TF-Boufarik Radio, Algeria, in SITOR-A (Selcal 58105) at 1536. (Hood-UK)

6286.5 UIDA-T/H *Volgobalt 238* working UCW4-St. Petersburg in CW at 1752. (Hood-UK)

6290.0 ELSJ3-Liberian flagged oil tanker m/t *Alfios* in CW at 0158 with four messages to unid coastal station. (Baker-OH)

6434.4 Royal Navy fleet broadcasts using 100 baud RTTY at 1509. (Boender-Neth)

6691.0 Lordship working Tabulate in voice and data at 0610. (Haverlah-TX)

6712.0 Andrews GHFS with repeat EAM at new Andrews position after 0600 of H+30 transmission time. 7JD working Andrews with phone patch to COMSUBLANT CWO for an "Exercise Esteem Higly Alpha" message. (Haverlah-TX) *Anybody have something solid on this USN communications exercise?-Larry*

6717.0 SAM 518 (EC-135K tail no 59-1518) working Andrews GHFS at 1438. (Jeroen Beijer-HZ Hengelo, Netherlands) Trout 99 working Andrews on F-875 at 2305. (Fowler-MA)

6721.5 E2H (French) working 9UN (American) at 0156. (Fowler-MA)

6730.0 Offutt GHFS with an EAM message at 1552. (Mark Redfox-Seattle, WA)

Namesake with 26 character EAM simulcast on 6730, 8968 and 11244. Picked up by GHFS at 1504. (Haverlah-TX)

6739.0 Nightwatch 01 working Andrews GHFS at 0415. Andrews advised 01 to meet them on "seven niner one nine five." (Haverlah-TX) *Interesting frequency they moved to. Jeff. That is a USAF TACS (Tactical Air Control System) and USOCOM joint operation frequency-Larry.*

6745.0 CIO2-Israeli Mossad numbers station at 2224. (Fowler-MA)

6761.0 Altus command post calling "any Altus aircraft" at 0217. (Haverlah-TX)

6868.5 Mike, Papa, and Echo Whiskey in a tracking net at 1323. Foxtro heard unsuccessfully calling the other stations on 6867.0. Somebody was off frequency. (J.L. Metcalfe-KY)

6986.0 SAM 29000 and Nightwatch 01 working Andrews at 0434. (Haverlah-TX)

6995.0 CW numbers station with message to 401, 5-digit groups at 1401. (Boender-Neth)

7305.0 JMH2-Tokyo Meteo, Japan, with a satellite photo fax sent at 0710. (Tull-Yukon)

7336.2 Long periods of encryption broken with occasional RYRY at 2016. 75 baud RTTY. USN? (Metcalfe-KY)

7337.0 English female 5-digit numbers station in AM at 2135. (Fowler-MA)

7470.5 English female 3/2-digit numbers station in AM at 1415. (Takashi Yamaguchi-Nagasaki, Japan)

7475.0 Dignitary working Nightwatch 01 with 01 passing 58 character EAM (pre-ambled CREETN) to Dignitary at 1548 which station had trouble copying due to selscan burst. (Haverlah-TX)

7586.0 RFVIT-FF Dzaoudi, Mayotte Islands, in 96 baud ARQ-E idling at 1510. (Yamaguchi-Japan)

7645.0 U.S. Navy tracking net at 2330. (Fowler-MA)

7678.5 Unid station with 50 baud RTTY repeating "RYs JFID HJ RY HW PL AMSA 44" at 1012. (Yamaguchi-Japan)

7700.0 Uniform 3 calling Uniform 23 at 2300. This is a DOE frequency, but these stations sounded like U.S. military. (Metcalfe-KY) *While the frequency may be authorized to DOE, usually the military guards nucs. This could be the answer why transmissions on this frequency sound like the military. Keep in mind the military can show up just about anywhere in the radio spectrum, so this doesn't surprise me-Larry.*

7870.0 Patrick AFB, FL-Several weather fax charts sent at various times. (Tull-Yukon) *Interesting. Ronald: how do you know that the station sending charts on this frequency is Patrick?-Larry*

7916.0 DGG91L2-PIAB Bonn, Germany, with 96 baud FEC-A German news at 1458. (Yamaguchi-Japan)

7946.0 RFVI-FF Le Port, Reunion Island, with 96 baud ARQ-E French messages at 1459. (Yamaguchi-Japan)

8040.0 GFA23-Bracknell Meteo, England, with weather fax chart at 0350. (Tull-Yukon) Fax weather chart at 1820. (Parmenter-MA)

8080.0 NAM-USN Norfolk, VA, with 0200 weather satellite image fax of the western North Atlantic, Caribbean, and the Gulf of Mexico. (Tull-Yukon)

8122.0 An unid station here at 2356 with radio check. (Metcalfe-KY)

8330.3 RFVI-FF Le Port, Reunion Island, with 100 baud ARQ-E3 idling at 1459. (Yamaguchi-Japan)

8361.7 Two Ukrainian ship operators having a private conversation using SITOR-A at 2159. (Hood-UK)

8400.5 UIAA-Tuna Trawler TSM *Obdorsk* at 0023 with 50 baud RTTY crew telegrams to Kaliningrad. (Baker-OH)

8405.0 5APP-m/v *El Djazair* working 5AT-Tripoli Radio (in English) using CW at

	0944. UYHX-T/H <i>Yanka Kupala</i> working US05-Izmail Radio in CW at 1705. (Hood-UK)	12487.0	UTUN-TKH <i>Akademik Iosif Orbli</i> at 1927 in SITOR-A with position report. (Baker-OH)
8417.5	KFS-Palo Alto Radio, CA, at 0627 with SITOR-B station info and traffic list. (Baker-OH)	12488.0	YLBD-Fridrihs <i>Canders</i> working YLQ-Riga Radio using SITOR-A at 1000. (Hood-UK)
8418.0	LSD836-Buenos Aires Radio, Argentina, at 0632 in SITOR-B with "Lista de trafico." (Baker-OH)	12493.5	UZWY-TKH <i>Kapitan Zamyatin</i> at 2013 in SITOR-A. (Baker-OH)
8422.0	NMC-USCG Port Reyes, CA, SITOR free signal CW ID at 0437. (Yamaguchi-Japan)	12497.0	ESAN-Valkla working UAT-Moscow Radio for position report to Tallinn using SITOR-A at 0956. (Hood-UK)
8459.0	NOJ-USCG Kodiak, AK, with fax weather charts at various times. (Tull-Yukon)	12610.5	RUF9-Krasnodar Radio working UWPS-Omskiy 27 in CW at 0814. (Hood-UK)
8467.5	JJC-Kyodo Tokyo, Japan, with Japanese newspaper sent in fax mode, no time given. (Tull-Yukon)	12688.5	UQK-Riga Fisheries Radio with CW marker and listening 8368.5/12552.5 in CW at 1246. Reports of the death of UQK seem wrong. (Hood-UK)
8494.0	SLHFM 'F and C' at 1530 in CW. Rare to see two SLHFM on the same frequency. (Yamaguchi-Japan)	12739.0	UAT-Moscow Radio with 50 baud RTTY news and traffic to the <i>Mihail Strelakowski</i> at 1332. (Boender-Neth)
8508.7	RFFX-FF Versailles, France, at 0216 using 72 baud ARQ-E idling. (Baker-OH)	12765.0	UCW4-St. Petersburg Radio working UPII-Nevskiy 14 in CW at 1802. (Hood-UK)
8677.5	UGC-St. Petersburg Radio with SITOR-B news broadcasts at 1539. (Boender-Neth)	12920.0	Unid 50 baud RTTY weather code at 0234. (Yamaguchi-Japan)
8682.0	NMC-USCG Point Reyes, CA, with north Pacific weather satellite images sent using fax around 0300. (Tull-Yukon)	13211.0	SAM 376 (C-135 tail no 60-0376) working Andrews GHFS at 1442. (Beijer-Neth)
8965.0	Moscow Base at 1633 working phone patch for SAM 29000 on the ALE net 6721 was another ALE frequency which was used (actual voice, not just tones). (Beijer-Neth)	13457.0	After a couple of selscan. WHX20-FAA Renton, WA, and KCP63-FAA Longmont, CO, voice at 1652. (Metcalfe-KY)
8968.0	Reach 90023 (self ID'd C-5A) working Andrews GHFS at 0228. Mission no PJ816601 in support of Phoenix banner mission at 0240. (Matt Cawby-Mt Lake Terrace, WA)	13866.0	English female 5-digit Lincolnshire Poacher numbers station at 1310. (Yamaguchi-Japan)
9011.4	Magic Carpet Sierra working Habitat and Golden Grizzly at 2333. Golden Grizzly advises he is XAF. Sierra 2 Echo working Habitat at 0952. Switched to green to give position report. (Cawby-WA)	14438.2	FJY2-DTRE Port-aux-Francais, Kerguelen Islands, with 96 baud ARQ-E3 idling at 0940. (Yamaguchi-Japan)
9013.0	Darkstar November, Bandsaw Juliet, and Dragnet Sierra at 1639, all very weak. (Haverlah-TX) <i>And all E-3 AWACS aircraft-Larry.</i>	14469.0	English female 5-digit Lincolnshire Poacher numbers station at 1110. (Yamaguchi-Japan)
9251.0	English female 5-digit numbers station at 2227. (Fowler-MA)	14583.6	Unid with 50 baud RTTY repeating "RYs OMZ-24 JTF-23" at 0710. (Yamaguchi-Japan)
9615.0	Spanish female 5-digit numbers station in AM at 0411. (Redfox-WA)	14912.5	SO0291-PAP Warsaw, Poland, with SITOR-A Polish news at 1455. (Yamaguchi-Japan)
10291.0	Ascot 5685 working Portishead Radio, England, for personal phone patch at 1308. (Hood-UK)	15041.0	Headliner working Nightwatch 01 at 2001. (Haverlah-TX)
10452.0	English female 5-digit Lincolnshire Poacher numbers station at 1006. (Yamaguchi-Japan)	15682.0	English female 5-digit numbers station Lincolnshire Poacher in AM at 1600. (Boender-Neth)
10473.5	Unid with 50 baud RTTY repeating "RY 44444 IGs DF OHBOs" at 0220. (Yamaguchi-Japan)	16113.0	Probable HBD20-MFA Berne, Switzerland, with SITOR-A German messages at 1113. (Yamaguchi-Japan)
10493.0	Muscular (USN or USAF) working WGY911-FEMA at Maynard, MA., at 1701. (Metcalfe-KY)	16277.0	JWT-Norwegian Navy <i>Stavanger</i> with SITOR-A news at 1357. (Boender-Neth)
10529.0	English female 3/2-digit numbers station in AM at 1315. (Yamaguchi-Japan)	16796.0	UCB2-RTMS <i>Atoll</i> with message to Novorossissk using 50 baud RTTY at 0840. (Hall-RSA)
10555.0	AXI34-Darwin Meteo, Australia, with poor fax chart at 1939. (Robert Hall-Capetown, South Africa)	16800.0	PNA Manila with SITOR-B news in English at 1205. (Hall-RSA) <i>Off frequency for their normal 16798.0-Larry</i>
10590.3	WGY906-FEMA Denton, TX, and WGY912-FEMA Berryville, VA, in clear 75 baud RTTY at 1643. Both stations in voice comms on 10588.0. At 1703, WGY908-FEMA Denver, CO, with RYRY, QBF and 1-0 counting test tape on 14778.3 kHz, also in clear 75 baud RTTY. Nice to see FEMA still testing in standard modes. (Metcalfe-KY)	16824.0	GKP6-Portishead Radio, England, SITOR-A traffic from Montemar/Mvdeo to Master CV <i>Angela/V2WG</i> at 1015. (Hall-RSA)
10597.0	English female 3/2-digit numbers station in AM at 1115. (Yamaguchi-Japan)	16830.5	SVU-Athens Radio working XSXY-m/v <i>Thetis</i> in SITOR-A at 1005. (Hood-UK)
10816.5	Unid with 75 baud RTTY encrypted 5-letter groups at 1602. (Yamaguchi-Japan)	16846.0	UGC-St. Petersburg Radio working UPAR-Akademik <i>Shukov</i> in SITOR-A at 1009. (Hood-UK)
10961.0	Unid with SITOR-A encrypted 5-letter groups at 1455. (Yamaguchi-Japan)	16927.0	UIW-Kaliningrad Radio with navigation warning messages using 50 baud RTTY at 1012. (Hood-UK)
11059.0	SAM 201 (USAF C-20B tail no 86-0201) at 1629 working Andrews on F-365. (Baker-OH)	16982.5	KOAT-Unid calling HKMR in CW at 1215. Old mystery key still around. (Hood-UK) <i>You're right and it is one of the few true mysteries left on HF-Larry.</i>
11123.0	English female 3/2-digit numbers station in AM at 1510. (Yamaguchi-Japan)	17036.0	UCE-Archangelsk Radio, Russia, with strange speed/shift RTTY (50/856), unable to decode. (Hall-RSA)
11162.0	Zodiac advising Hawkeye that new mission is to provide air defense priority two for rest of exercise. Drip Pan and Hardball calling Zodiac every 15 minutes with radio checks. One Way requests a maintenance vehicle. He has a flat tire - position 865 065 on the grid. (Cawby-WA) <i>I have nothing in my files on this one Matt-Larry.</i>	17050.0	4XZ-Haifa Radio, Israel, with V CW marker at 1920. (Parmenter-MA)
11175.0	At 1447 and 1449, Offutt with two 20 character EAMs "For Tabber" (sounds like) and "For 6ABW." These EAMs heard over a two day period. Gold 11 working Andrews asking Andy for "HF traffic." Andrews advised that there was no "current traffic." Another case here recently of a tanker looking for the current EAM string. (Haverlah-TX) <i>Well, that is at least one group of military assets that EAM broadcast are definitely transmitted to-Larry.</i>	17074.0	LGX-Rogaland Radio, Norway, with CW traffic list at 1400. (Boender-Neth)
11181.0	Firehose working MacDill at 1925. (Haverlah-TX)	17141.3	USU-Mariupol Radio, Ukraine, with 50 baud RTTY telegrams for several ships. (Hall-RSA)
11187.0	Spacehead calling Boomtown on self ID'd Charlie Bravo at 1330. (Haverlah-TX)	17441.8	Coded weather at 1829 using 100 baud RTTY. Any ideas? (Metcalfe-KY) <i>Probably 5YE-Nairobi Meteo, Kenya see next log-Larry.</i>
11191.0	Blackhawk 01 in the blind, ETA plus seven to Buffalo at 2231. (Fowler-MA)	17422.0	5YE-Nairobi Meteo, Kenya, with 100 baud RTTY RY/ID and weather codes at 1042. (Hall-RSA)
11220.0	Trout 99 (C-135 tail no 61-2669 412 TW) working Andrews GHFS at 1120, later switched to 11214 and inbound Ramstein. (Beijer-Neth) Nightwatch 02 working Nightwatch 01 at 1635. (Haverlah-TX)	17499.0	English female 5-digit Lincolnshire Poacher numbers station at 1020. (Yamaguchi-Japan)
11229.0	WAR46 working Nightwatch 01 at 2002. (Haverlah-TX)	17529.2	Cuban diplomatic station with 5-digit number groups at 1822 using 45 baud RTTY. (Metcalfe-KY)
11244.0	Andrews with two 20 character EAMs "For Obtuse" at 1333, McClellan with 20 character EAM "For Torch Bearer" at 1250. (Haverlah-TX)	17972.0	Astrojet working Nightwatch 01 at 1255. (Haverlah-TX)
11494.0	Astrojet at 1715 calling Nightwatch 01. Mainsail. No joy on S-311. (Baker-OH) Nightwatch net with Nightwatch 01, Neonlamp, and Namesake (both EAM broadcasters) at 1636. (Haverlah-TX)	17976.0	Offutt with a 20/20/26 character EAM set over a 10 minute period at 2035. (Haverlah-TX)
11545.0	English female 5-digit Lincolnshire Poacher numbers station at 1510. (Yamaguchi-Japan) Same at 1900. (Boender-Neth)	18021.7	Egyptian Embassy Luanda, Angola, with SITOR-A traffic in Arabic for MFA Cairo. (Hall-RSA)
11570.0	English female 5-digit Lincolnshire Poacher numbers station at 1110. (Yamaguchi-Japan)	18046.7	Probable Portuguese Embassy in Kinshasha, Zaire, with urgent SITOR-A traffic in Portuguese for MFA Lisbon. (Hall-RSA)
11610.0	English female 5-digit number station in AM at 0300. (Haverlah-TX)	18255.3	CNM78-MAP Rabat, Morocco, with French news at 1115 using SITOR-A, listed as MEA New Delhi. (Hall-RSA)
12481.0	URTB-SS <i>Gepard</i> at 2052 in SITOR-A with one telex via Odessa Radio after sending selcal KCPX. (Baker-OH)	18283.0	Probable HBD20-MFA Berne, Switzerland, with SITOR-A German and French messages at 1148. (Yamaguchi-Japan)
		18324.9	CLP44-Cuban Embassy Harare, Kenya, with 50 baud RTTY traffic in Spanish at 1520. (Hall-RSA)
		18780.0	Unid "Batang ABUSAYYAF" with SITOR-B English messages at 0610. (Yamaguchi-Japan)
		18966.7	RFHJ-FF Papeete, Tahiti, with 96 baud ARQ-E3 idling at 0635. (Yamaguchi-Japan)
		20633.7	RFVI-FF Le Port, Reunion Islands, with 100 baud ARQ-E3 idler at 0935. (Yamaguchi-Japan)
		22376.0	NMC-USCG Point Reyes, CA with SITOR-B navigational warning messages at 0531. (Yamaguchi-Japan)
		22399.0	A9M-Hamala Radio, Bahrain, with SITOR free CW ID at 1145. (Yamaguchi-Japan)

ARGENTINA AM & FM stns relayed weekends on USB/LSB 13361, 15780 or 20276, include: R. Continental, R. Rivadavia, R. Mitre, R. Libertad, R. Del Plata, R. El Mundo, R. América, FM 100, FM Feelings, FM Top 40, FM Radio Uno, FM Hit, FM Rock & Pop. Also on Mon 0200-0300 is R. Provincia de la Plata on 13361 with programs for Antarctica including English announcements (Cornachioni via Lok, DSWCI SW News) 13361-LSB also carries *De Colección*, music and call-ins from LS11-1270, Sun 2300-0200 Mon to Antarctic bases (Jorge Alloy via Lerner via Fleming, *Cumbre*, via RNM) Unaware of SW relays, stations won't believe your report unless tape included. Feeling FM QSLed for me (Harald Kuhl, Germany, BC-DX via NU via Radio Nuevo Mundo)

With CRI Mali moved from 11715 to 11760, RAE is clear on 11710 with English weekdays 0200 (Kevin Hecht, PA, W.O.R.) Includes DX program UT Thu 0235, but 0200 hour subject to preemption for ball games in Spanish (gh) 11709.56 (Alexander, PA)

AUSTRALIA One of RA's best frequencies, 9580, blocked this season by WEWN at 1300-1600 (Sheldon Harvey, PQ) Not scheduled by RA, and not for NAM anyway, too far away and too many hops required (Stanley Leinwoll, WEWN) Any American who has listened to SW the past 30+ years knows 9580 as a prime RA freq. and in fact is in use from 1230, clashing with WEWN after 1304. WEWN has plenty of other choices (gh, W.O.R.)

BANGLADESH RB English 1230-1300 this season on 7185v, 9548v; 1815-1900 7190, 9568, 15520 (Weerakoon & Goonetilleke, Sri Lanka, UADX via BC-DX via Thurman)

BELGIUM RVI shifted 13605 to 13610 at 1300 (Sun 1230) to avoid Australia; 2330 moved SAM xmr off 9925 to 11690 (via John Norfolk, Joe Hanlon, Steven Cline, Bob Thomas) They didn't foresee trouble from mixing product of super-strong French Guianans on 13640/13625 (gh)

BOUGAINVILLE R. Free Bougainville, Arawa, intermittent when fuel is available on 3850v or 3880 at 0900-1100. [non] Countering it is PNG govt's R. United Bougainville, Loloho, 3880v or 6010 at same time (BBC Monitoring)

CAMEROON R. Garoua back on 5010 irregularly 1810-2150+, subsequently gone again (Finn Krone, Denmark, AWR Slovakia *Wavescan*)

CANADA Sheila Copps, Heritage Minister and Deputy Prime Minister, who championed RCI, had to resign in early May because of a campaign promise to do so if the GS tax were not repealed; she was expected to be re-elected in mid-June, but might not resume same portfolios. Replacing her was Ms. Lucienne Robillard. Strikes contemplated against CBC would not affect RCI workers, under different unions, but CBC programming from elsewhere might not be available (Bill Westenhaver, B. Cooley, W.O.R.)

RCI at 2305 Sunday on 13670, 9755, 5960, resumed *Tapestry* instead of *Global Village* series on jazz (gh)

CKFX, Vancouver, 10 watts on 6080 is gone for good as management decided not to spend C\$1K for new transmitter (Hans Johnson, DXing with *Cumbre*)

CHINA CRI sked announcement for ENAm at 0356 on 9690 was totally "fubar" for evening, but gave revived morning airing of 1200 on 11795; confirmed but weak here, target elsewhere? (gh, OK, W.O.R.)

COSTA RICA REE relay on 3210 ex-

3225 (Hans Johnson, *Cumbre DX* via HCJB DX Partyline) Tu-Sa 010-0400 (gh)

Following successful fund-raiser, RFPI began weekly live call-in *Far Right Radio Review*, UT Weds 0200-0300 on 7385, 6205-usb, other times being playbacks (gh)

TIAWR finally put *La Onda Mundial DX* program on at a definite time—Sun 1315 on 9725, 13750 *et al.*—very elementary stuff like explaining SINPO and played same show two weeks running. Meanwhile, *Wavescan* in English occasionally appears Sun 1100 and/or 2300 on 9725 *et al.* with yet another new announcer, clueless on pronunciation of common SW terms and names such as Deutsche Welle ("douche well")—and this error-laden edition was repeated at least three weeks running (gh)

CUBA All five winners of trips to Cuba in RHC's 35th anniversary contest were from Latin America—so why even promote the contest in English? Essays necessarily judged subjectively, so political correctness counts! Horrible buzz +/- 15 kHz from 11875 in Spanish at 0055 (gh) English at 2100-2200 on new 13715 and SSB on 13725; 0500-0700 WNA back on 9820 as before 0500 to ENAm (Arnie Coro, RHC DXers Unlimited) Remember, whenever you hear RHC jamming-free, Cubans do not have the same privilege in listening to US transmitters (gh)

[non] R. Martí has been authorized by Pres. Clinton to relocate from Washington to Miami, part of a budget bill signed Apr. 26: a victory for Jorge Mas Canosa. Investigation into improprieties by USIA IG ceased and IG eliminated, oversight transferred to State Dept. Critics fear the move will sap the station's credibility by becoming a mouthpiece for certain exile leaders (Christopher Marquis, Miami *Herald* via Aaron Pilchick)

CZECH REPUBLIC KNLS Alaska visited here among other sites looking for ex-jamming transmitters to reach European Russia, Islamic nations rimming Mediterranean; funds still to be raised (Mike Osborne, KNLS via Hans Johnson, *Cumbre DX* via BC-DX)

DENMARK [non] RDI via Norway at 1230 to SAM on 15480 ex-11840, also suitable for ENAm, incl English first Sun 1238 (Erik Kjøie, RDI via DX Window & via Joe Hanlon) English expanded to twice monthly, 1st and 3rd Suns from June (Bruce MacGibbon via Joe Hanlon)

DOMINICAN REPUBLIC R. Quisqueya back on 6235.2 at 2216-2355+ (Bob Hill, MA, HCJB TLC) Also heard including English IDs, no longer Santo Domingo address but P.O. Box 363, Puerto Plata (Jerry Berg, MA, *ibid.*)

ECUADOR HCJB is cancelling ANDEX club and bulletin due to soaring costs of postage and other expenses; refunds being sent (DXPL via John Norfolk)

FALKLAND ISLANDS [non] BBC special service to here audible in NAM, Tue & Fri only 2130-2145 on 11680 (gh, OK, W.O.R.)

INDIA AIR now on Internet; access news free at: <http://air.kode.net> (BBC Monitoring) The six 500 kW transmitters at Doddaballapur near Bangalore are each named for large rivers in India—Ganga, Cauvery, Narmada, Yamuna, Godavari, Krishna (Adrian Peterson, *Wavescan* via NASWA Journal)

INDONESIA Kang guru 2 audibility on 9680, Tue 1230, averaged every other week, suspect frequency not always active, then three weeks running (gh) Same heard on 15150 (William Kitching, UK, World DX Club Contact) Seems 9680 & 15150 may

*All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; Z-96 = Summer season*

alternate (David Clark, Ont., *Fine Tuning*) Greg Clough, host of this English-teaching show, sent listing of RRI provincial stations carrying it (Ron Howard, CA) From which we excerpt some in local evenings when we might hear it: Sorong 4875 Wed 1230, Semarang 3935 Mon 1215, Banjarmasin 3250



Wed 1230, Pontianak 3995 Sun 0900, Ternate 3345 Fri 0815, Kendari 3995 Wed 1110, Padang 4003 Fri 1215. Greg said OzAid funding for show renewed for only 4 months from June (gh, W.O.R.)

IRAN VOIRI on new 6050 to us at *0027-0128*, ex-6015, fair level but co- and adjacent-channel interference; better on 9022 (Brian Alexander, PA, W.O.R.) Also on new 9685 at 0030 (Kevin Hecht, PA and Robert Yowell, OH)

IRAQ [non] V. of the Iraqi People, presumed on 9568.39 //11710 two different days between 2131 and 2354*v in Arabic, closing with Koran (Brian Alexander, PA, W.O.R.)

IRELAND Radiofax, missionary programs Sunday afternoon and night on 3910, 6295, 12255 (Thomas Voelkner, *Church on Radio* via BC-DX via Thurman)

ITALY R. Speranza, 6220, with music, religious talk, poor mod, 2339-0130+, peaking at 0000 (Jerry Berg, MA, *DX Window*)

NEXUS/IBA Milano faces financial crisis which may force us off the air—government rules we must pay more than US\$20K as annual license fee, as must the only two other legal private Italian SW stations. We have agreed to cooperate with WRMI in promoting international public access radio on SW (Alfredo Cotroneo, IRRS)

JORDAN Jordan R. in English, 11970 from 1400 past 1500 when RFE clashes; includes pop music, interviews, quizzes (Giovanni Serra, Italy, *The Four Winds*)

KAZAKHSTAN R. Almaty Int'l in English daily 0000-0030 on 6230 (Roger Tidy, England, W.O.R.)

KURDISTAN V. of Iraqi Kurdistan verified 4184 with personal letter from Nemat Sharif, Kurdistan Democratic Party, P.O. Box 2443, Merrifield, VA 22116 (Vashek Korzinek, RSA, *Play-DX*)

LEBANON R. Lebanon has selected Continental Electronics to modernize itself at a cost of \$33 million, including six new SW, AM and FM transmitters (UPI via David Alpert) How many are SW?

LESOTHO BBC will close relay here at end of Sept, replaced by more on SW via S. Africa. Seems R. Lesotho's own 4800 SW will also close since is at same BBC site (BBCM) Try BBC 3255 at 0300 English news (Anker Petersen, Germany, *BC-DX*)

LIBERIA ELWA, 4760, heard in late April during renewed fighting in Monrovia, but running out of fuel and staff being evacuated (Hans Johnson, *DXing with Cumbre*) SIM officials fear it's the end of ELWA radio, hospital (HCJB TLC) So much for Eternal Love Winning Africa (gh)

LITHUANIA [non] R. Vilnius, English at 0030-0100 via DW Germany on new 9560, clashes with Ukraine; foreign service no longer carried on 9710 earlier (Sigita Zilionis, USA, *DX Window* via Thurman)

MALI CRI relay lease, expiring in 1998, has already been renewed until March 2007 (Xinhua via BBCM)

MOLDOVA For reasons unknown, at least three—probably four—of the five 1000 kW transmitters at the Grigoriopol' site, went off the air April 29 and were still off two weeks later. When power bills are not paid, normally the entire site is silent, but one transmitter remained: 7125 with V. of Russia English 2230-0100, Russian to 0500; also 15430 1000-1800, 11840 1830-2200 in Russian. Presumably reasons were technical. Missing frequencies were 7230, 9620, 9665, 11750, 11945, 15340, 15400, 17855 (Kevin Hecht, PA, W.O.R.) At least cleared

11750, 15400 for BBC! (gh)

R. Dnestr Int'l has new *DX Herald* program, third Sat, repeated Mon at 2030 on 11750 (VOR *DX Klub* via BBCM) If and when back on air

NETHERLANDS RN Bonaire 9590 clashes with Channel Africa, both in English between 0455 and 0525; coordinate! Also, instead of publicized crash-start at 0230 on 9590, RN overlapped with BBC at 0228 (gh) Again this summer RN Bonaire in Dutch at 2130-2225 on 15315, 15155 put mixing product on 14995 (Kevin Hecht, PA)

RN's documentaries are now on primary hour Weds such as UT Thu 0052 and 0452, secondary hour Fris such as 2352: *July 3*, *Lessons in Revolution*; *July 10 & 17*, *Preparing for Atlanta*; *July 24 & 31*, *August 7*, *Living on the Land*, in Ireland, Scotland, Holland (*On Target* via Diane Mauer, Bob Thomas, Jim Moats, Steven Cline)

NEW ZEALAND RNZI adjusted sked to avoid QRM: 1953-2150 9810, 2150-2305 11735, 2306-0500 15115 (RNZI Mailbox)

PERU R. LTC, 5980 [see last month] is testing with 600 watts; reports welcomed and verified by fax to (+51)54-322570 (Henrik

Potencia y Calidad Klemetz, Colombia, *Play-DX*) **Radio LTC** El noticiario LTC is newscast name at 1100-1400, 0000-0200 but station name is R. Comercial Collao Comercial Collao, Juliaca. R.

Estación Vernacular is tentative ID on 5453.7 to 0105* from San Miguel, Cajamarca, weak, and endless huaynos (Klemetz, *Dateline Bogotá* via *Radio Nuevo Mundo*)

New stations heard: R. América, San Pablo, Cajamarca, evenings on 5139.78, awful audio (Klemetz & McVicar, HCJB *DXPL*) R. Los Andes, Huarmaca, 6479.7 very good at 0200. R. Estación Uno, Pucará, Jaén, 5955.1 -0257*. R. Gotas del Oro, 4524v at 1040 (Henrik Klemetz, Colombia, HCJB *DXPL*) R. La Voz del Marañón, Cajabamba, 5604.1 -2329* one day, -0017* the next (Klemetz, *Dateline Bogotá* via *DXPL*)

AWR projects new 5 kW SW station at Juliaca from early next year, using the Costa Rican transmitter previously planned to move to Guatemala; instead of the Paraguayan site which has not eventuated due to fund transfer problems. Will beam SE in Spanish, Quechua on international bands; may add more outlets later (AWR *Radio News Bulletin*)

PHILIPPINES FEBC *DX Dial* Wed 1315 on 11995, repeated Sat 0940 on 11635, 1440 on 11995 (Alok Das Gupta, India, ARDXC *EDXP*)

RUSSIA Radio NERRS (Northern European Radio Relay Service) plans to get SW license by August for 200 kW via GPR-2, St. Petersburg; open to all but clandestine, political, disestablishmentarian programs; info from fax +7 (812) 2342971 (Alexei Osipov, *ibid.*)

IBRA Radio daily in Arabic *1900-1930* on 12020 with Cyprus address (Bob Hill, MA, HCJB *TLC*)

ST. HELENA Info on R. St. Helena Day 1996, Oct. 27 1900-2300 on 11092.5 can be found at: <http://www.algonet.se/~ltd/sthelen> (John Ekwall, *hard-core dx* via *DX Window*)

DX Listening Digest

More broadcasting information by country compiled by Glenn Hauser

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Glenn Hauser, Box 1684-MT, Enid, OK 73702

SERBIA R. Yugoslavia announced summer sked in English: 1830 on 6100, 9720; 2030 on 7230; 2100 on 6100, 6185; to us 0000 exc Sun on 9580, 0430 on 11870. I also heard 11870 at 0000 clashing with Budapest (Kevin Hecht, PA) And 9580 also good at 0430 (gh)

SINGAPORE R. Singapore Int'l. English at 1100-1400 on 6015 now also on 6155, domestic R. One freq. still heard before and after this (Sarath Weerakoon & Victor Goonetilleke, Sri Lanka, UADX via DSWCI)

SLOVAKIA AWR, new 7215, weak in English 0545-0559* (Brian Alexander, PA) Good here on UT Sun 0530-0558 for AWR *Wavescan*, best version to hear if you can, with additional DX tips (gh)

SOUTH AFRICA [see NETH] Channel Africa, 9590, Sat 0515 has mailbox; mentioned new *Hello Africa* program magazine (Arthur Cushen, RNZI Mailbox)

Capital Radio, Transkei lost transmitters in a thunderstorm in late 1994, hard to repair. S. African government now owns and put it up for sale (Hans Johnson, *Cumbre DX* via BC-DX)

SRI LANKA VOA registrations for new Chilaw relay site show 500 kW on 6030, 7105, 7270, 9705, 9770, 11805, 11915, 11945, 15140, 15205, 17740, 17805, 17865 (HFCC via BC-DX via Thurman) But unlikely to be on for several months yet (gh)

DW's reactivated Trincomalee relay registrations for Z96 include English: 0200 on 9615, 0600 on 17820, 21680, 0900 on 11730, 17715, 1600 on 6170, 1900 on 7170, 9670, 2100 on 11785, 2300 on 5980 (Wolfgang Büschel via George Thurman)

SURINAM R. Apintie QSL letter says 4990.93 was a Philips 50-watt transmitter, 5-element monoband doublet log-periodic with 10 dB gain (Ch Vervuurt, GM via Randy Stewart, MO) But is the linear operating at full rated power? (Stewart)

SWITZERLAND SRI Z96 no longer shows services from Sarnen or Beromunster sites; two Beromunster SW transmitters were dismantled by a North Korean company; Sarnen still there but future uncertain; two at Lenk face environmental concerns (Swiss Telecom via Mick Ogrizek, ARDXC EDXP)

TAHITI RFO occasionally fair on 15167v 0200+ French with pop music (Randy Stewart, MO)

THAILAND Or Sor, Royal Palace, still on 6149 in splash from Singapore, 1130-1200* (Sarath Weerakoon, Sri Lanka, UADX via DSWCI)

R. Thailand via VOA Udorn, English Z96: 0000-0030 As/Af 9690; 0030-0100 E USA & 0300-0330 W USA 15370; 1900-2000 Eu 7210; 2030-2045 Eu 9555 (via Dave Jeffery)

TIBET Lhasa on new 7195, ex-7110? at 1234 local program //5020, 6200, 4035, 4820, 5950; 1300 relay Beijing (David Foster, Australia, HCJB TLC)

UKoGBaNI WYFR relay via BBC Skelton Z96 1800-1900 Arabic on 9825 (BC-DX via ARDXC EDXP)

BBC WS may have to stop broadcasts to sub-Saharan Africa, central Europe, Brazil later this year because of funding cuts (Reuter via David Alpert; REE *Distance Unknown* via Diane Mauer)

Ran across unpublicized BBC test of ID Logic May 15-17 1745 on 13680, music alternating with data bursts, strong but site unknown; info for listeners, will try to decode on my M-7000 (Sheldon Harvey, Quebec, W.O.R.)

UKRAINE RUI English at 2100 heard in Ukrainian instead on listed frequencies; only reliable English is 0000 & 0300 on 7150 from a site

with four names—Mykolayiv, Kopani, Simferopol', Yevpatoriya, not all near each other (Kevin Hecht, PA)

USA WWCR moved 3315 to 3230, but bothered by equally strong utility on 3233, and at times RTTY right on 3230, so two weeks later moved to 3215. One racist program has disappeared from WWCR—*Herald of Truth* (gh) More times for *The Old Record Shop*, *Ken's Country Classix*—UT Sun 0330-0430 on 2390, Sun 2030-2130 on 9475. New music shows at tentative times: *Juke Box Gold*, Fri 2100-2200 on 12160; polka show Sat 1400-1500 on 12160. *Rock the Universe* added Sun 1700-1800 on 9475 (Adam Lock, WWCR)

WORLD OF RADIO revised times on WWCR, with more opportunities for good reception: Thu 2030 & Fri 2115 on 15685, Fri 2215 on 9475, Sat 1600 on 9475, Sun 0300 on 2390, 0800 on 3215, 0900 on 5065, 1800 on 12160, 2130 on 9475, Mon 0430 on 3215, 2030 on 15685, Tue 1230 and Wed 1130 on 15685. *Mundo Radial*, monthly Spanish DX report, follows the Fri 2215 airing at 2245 on 9475; also Wed 2100 on 15685 (gh)

WYFR blows away HCJB's low-power SSB on 21455, 1600-2045 in Eu languages. Of all available 13mb frequencies, why pick HCJB's? (Kevin Hecht, PA) Simply don't care, and/or wanted lowest spot on band for MUF barely poking up there—from same people who brought you WEWN on Australia's 9580 (gh)

Don't you believe that WNYW was sold to the Christian Science Church and is presently WCSN, as "Alice Brannigan" wrote in the June *PopCom*. WNYW was owned by the LDS Church for a while, but was ultimately sold to Family Radio and became WYFR; and two years ago WCSN was sold to Prophecy Countdown, became WVHA (gh)

WVHA sometimes closes earlier than scheduled. Pastor Osborne announced problems with 6-11 MHz antenna, and at half power 250 kW monthly electricity costs \$7.4-10K. Still difficult to make payments on loan to purchase WVHA and it may have to be sold. (Jim Moats, OH, W.O.R.)

KAIJ, Dallas, finally adjusted sked to end conflict with VOA on 13740—now only at 2300-2400; 9815 at 0100-1300, 15725 1400-2200 (Jim Moats, OH, W.O.R.)

WGTG, 9400 carries AWR *Wavescan* Wed 2130 (*DX Window* via Thurman) Not yet, but Bill Matthews may voice it (WGTG via Hans Johnson, *DXing with Cumbre*)

WHRI founder Dr Lester Sumrall died April 28 at age 83, survived by sons Frank, Stephen and Peter and 11 grandchildren (Indianapolis *Star* via Steven Cline) Will power struggle for succession ensue? (gh) *DXing with Cumbre* on WHRI: Sat 0500 on 5760, 7315, 2230 on 9495, Sun 0330 on 5745; KWHRI Sat 0200 on 17510, 0500 on 17780, Sun 1830 13625, Mon 0330 on 17510 (Marie Lamb, USENET via Thurman) Also still heard Fri 2230 on 5745 (gh)

VOA's world-famous jazzman Willis Conover died May 17 of throat cancer at age 75 (NPR *Weekend Edition*) English at 1500-2200 is on Greenville LSB feeders 10454, 19379 (VOA via BC-DX via Thurman)



UZBEKISTAN R. Tashkent Z96 additional to last month in English: 1200 & 1330 on 7285; 0100 on 7285, 5975, 5955 (Nagoya DX Club via ARDXC EDXP)

VANUATU Verification letter from VBTC signed by Allan Kallfabun, Sales & Marketing Consultant, asked for US\$14 cash in next letter

for "program" [schedule?] (Eric Walton, BC, WDXC *Contact*)

ZAMBIA Two new 100 kW Continental SW transmitters bought with Chinese aid, were almost finished for ZNBC national coverage, along with three new antennas each for 60, 49, 41mb (Roger Stubbe, Zambia, HCJB *Latest Catch*)

Until the Next, Best of DX and 73 de Glenn!

Broadcast Loggings

Gayle Van Horn

SHORTWAVE BROADCASTING

0002 UTC on 7240

RUSSIA: Voice of Russia. News focus on eastern European issues. Amateur radio interference. VOR noted as; 1502 on 15400; 1924 on 11675. (Sue Wilden, Columbus, IN) *Focus on Asia* heard on 9665 at 0026. (Jim Moats, Ravenna, OH) VOR monitored on 7350 at 0353. (Stokes Schwartz, Madison, WI) News heard on 9665 at 2228-2247. (George Knight, Garfield, NJ)

0045 UTC on 6725.52

PERU: **Radio Satellite**. Spanish. Avisos and advertisements alternating with brief local instrumental music. "Atencion Santa Cruz" comunicados to station IDs and canned promos. Peruvian music to "Radio Satellite que transmite en todo el territorio nacional," and time check. Peru's **Radio Cora** heard in Spanish on 4914.42 at 0322. (Giovanni Serra, Rome, Italy)

0106 UTC on 9905

FRENCH GUIANA: **Swiss Radio International** relay. Station information to newscast and ID noting French Guiana relay station. (Maywoods DX Team, KY: Loy Lee, Jim McClure, Dr. Joel Roitman, Chuck Everman, Eric Petty, Ed Shaw, John Haffendorfer) **Radio France Int'l** relay noted on 13625 at 1250 with *Art in France*, // 15530. (Bob Fraser, Cohasset, MA; Tom Banks, Dallas, TX)

0110 UTC on 7115

YUGOSLAVIA: Radio Yugoslavia. Male/female announcer duo to English newscast and ID at 0115. (Maywoods DX Team, KY) Station noted 2357-0035 on 7115. (Knight, NJ; Wilden, IN)

0120 UTC on 15240

AUSTRALIA: Radio Australia. *Network Asia* with good signal quality, heard on // 13755, 15365, 17795. (Moats, OH) Station noted on 11880 at 0408. (Wilden, IN; Banks, TX; Sam Wright, Biloxi, MS)

0130 UTC on 9540

SPAIN: Radio Exterior Espana. Spain's newspaper headline updates to Spanish service at 0145. (Knight, NJ; Wilden, IN; Wright, MS)

0132 UTC on 15115

NEW ZEALAND: Radio New Zealand Int'l. *Cadenza* classical music program at tune-in. Frequency/ID quote to time pips and 0200 newscast. (Moats, OH; Frank Hillton, Charleston, SC)

0133 UTC on 4702.25

BOLIVIA: **Radio Eco San Norja** (tentative). Spanish. Latin songs, possible male talk under very heavy static. Bolivia's **Radio Illimani** heard in Spanish on 4945.03 at 0114, with long economic commentary. Possible political interview with Bolivian president. Station also heard this frequency at 0252. (Serra, Italy)

0218 UTC on 4755

BRAZIL: **Radio Educacao Rural**. Evening DJ's lively format including Braz pops and "Campo Grande" IDs. Brazil's **Radio Clube** heard on 3379.88 at 0241; **Radio Cancao Nova** heard on 9675 at 0310 with music program, IDs and talk of Brazil. **Radio Dif. Amazonas** heard on 4805 at 2344. (Maywoods DX Team, KY)

0234 UTC on 7205

GREECE: VOA relay. *VOA Today* show featuring updates on civil unrest in Sri Lanka. Fair signal quality. (Moats, OH)

0240 UTC on 4960

ECUADOR: **Radio Federacion**. Spanish. Regional music and news to lady's ID at 0251. Two additional Ecuadorian stations heard in Spanish as; **Radio Quito** on 4919 at 0256, **Radio Centro** on 3289.8 at 1027. (Maywoods DX Team, KY)

0320 UTC on 17864

PHILIPPINES: Radio Philippines. Local news to world headlines at 0325. Station ID at 0328 with anthem and 0330*. Distorted audio. (Jerry Witham, Keauau, HI)

0329 UTC on 3396

ZIMBABWE: **ZBC Corp.** Religious hymns to announcers' text in local dialect. ZBC's **Radio 3** heard on 3396 at 0438 with talk and hiliife music. ZBC's **Radio 4** noted on 3306 at 0448 with Afro music, ads and "Radio Four" ID. (Maywoods DX Team, KY)

0335 UTC on 9670

RUSSIA: Radio Mayak. Russian. Male/female chatter to "Radio Mayak" jingle at 0445. Signal then degraded by co-channel transmitter testing. (Witham, HI)

0341 UTC on 4954.98

COLOMBIA: **Radio Nacional de Colombia**. Spanish. Romantic tangos to 0401. Musical program listing singers and musicians to "canned" ID. Colombia's **Ecos del Orinoco** noted on 4905.47 at 0416. (Serra, Italy)

0350 UTC on 9585

QATAR: Qatar BS. Arabic. Middle Eastern music to announcer at 0355 with mentions of Qatar, reception improving after 0400. (Witham, HI)

0500 UTC on 4775.4

PERU: **Radio Tarma**. Spanish. Peruvian flute music to station promos and "Radio Tarma" ID. Peru's **Radio Huanta** noted on 4746.8 at 1057, with religious text to ID. (Maywoods DX Team, KY)

0515 UTC on 5019

NIGER: La Voix du Sahel. French. Native drums to recitation segments. Presumed news items to ID. (Van Horn, NC; Maywoods DX Team, KY; Hilton, SC)

0550 UTC on 5047

TOGO: Radio Lome. French. African hiliife music to 0600 ID. National and regional news topics to announcer's talk and live phone call-in. (Van Horn, NC; Serra, Italy)

0600 UTC on 9825 USB

KIRIBATI: Radio Kiribati. BBC sports news relay to ID and talk about Kiribati. Heavy interference noted at 0614. (Maywoods DX Team, KY)

0715 UTC on 7180

NORWAY: Radio Norway. Report on Norwegian fisherman using cellular phone to summon assistance, when he discovered himself adrift on an ice flow! Station ID at 0718. (Witham, HI)

1008 UTC on 17387

INDIA: All India Radio-Aligarh. Closing English news headlines to 1010 ID into political commentary. Indian music to announcements, speech excerpts and press review 1050-1055. Station ID to 1100*, // 13700, 15050, 17890. (Serra, Italy)

1130 UTC on 4890

PAPUA NEW GUINEA: (Papua Territory) **NBC**. Country & Western music to local time check. Michael Jackson's *Black & White* song to NBC ID. PNG's (Admiralty Islands) **Radio Manus** noted on 3315 at 1139; and **Radio East Sepik** (New Guinea) heard on 3335 at 1147. (Maywoods DX Team, KY)

1218 UTC on 4930.6

HONDURAS: **Radio Internacional**. Spanish. Local news with commercial breaks. Station ID at 1230 with promos. **La Voz Evangelica** heard on 4819.76 at 1242 with religious music at ID at 1246. (Maywoods DX Team, KY)

1220 UTC on 6135

SINGAPORE: Radio Singapore International. Pop music tunes to lady announcer. Station ID and announcer chat. (Maywoods DX Team, KY)

1241 UTC on 9445

TURKEY: Voice of Turkey. English news to ID and classical music bridge. Program *Ancient Coin in Anatolia* to Turkish pop songs, // 9630. Turkish service heard on 9560 at 1430 (Serra, Italy)

1400 UTC on 11970

JORDAN: Radio Jordan. Frequency quote to program preview. Interview with embassy official on the nation's environmental concerns. Monitored to 1428. (Serra, Italy)

1800 UTC on 11990

KUWAIT: Radio Kuwait. Program feature, *Islam, the Religion of Truth, Right and Justice*-speaking on spiritual powers. (Fraser, MA) Station noted this frequency 2035-2054. (Knight, NJ)

1824 UTC on 15475

GABON: Afrique Numero Un. French. African Makossa music followed by station ID and world news. (Edward L. Mentee, Kansas City, MO; Knight, NJ) *Le Journal* heard on 17630 at 1312-1314. (Serra, Italy)

1845 UTC on 13625

SWITZERLAND: Red Cross Broadcasting Svc. Feature on landmines. Fair signal quality. (Moats, OH)

1907 UTC on 15540

ECUADOR: HCJB. News bulletin in progress at tune-in. *DX Party Line* at 1909 with feature on natural radio. Fair to good signal quality. (Moats, OH) HCJB also noted at 1130 on 15115 with *Wee Kids* program. (Fraser, MA) *Saludos Amigos* heard on 9745 at 0113. (Wilden, IN)

1944 UTC on 7090

ANGOLA: A Voz do Resistencia de Galo Negro (tentative). Portuguese. News, music breaks and canned announcements (with possible ID). World news on the United States, possible ID and 2120 UTC on 9700 jingle, male announcement mixed with song and news. (Serra, Italy)

2120 UTC on 9700

BULGARIA: Radio Bulgaria. Report on a meeting of European bankers in Sofia, heard on // 11720. (Fraser, MA; Moats, OH)

2151 UTC on 15745

USA: WVHA. *Prophecy Countdown* to 2155 frequency change to 5850. Station ID to *Amazing Facts* program. (Knight, NJ)

2245 UTC on 9655

TURKEY: Voice of Turkey. *The Veiled World*-the sultans' pages and their entertainment at functions. (Fraser, MA)

2248 UTC on 9605

UNITED ARAB EMIRATES: UAE Radio. Relay of Capital Radio with 50's oldies music show. Time check, ID/frequency quote and address heard with fair quality on // 9695. (Moats, OH) National news heard on 9770 at 2300. (Wilden, IN)

2340 UTC 4815.01

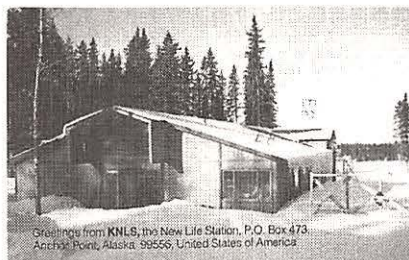
BURKINA FASO: RD Nationale du Burkina. French. Pop, afropops and jazz songs presented by male DJ, with talk and ID after each track. Dual IDs as, "Radio Burkina, la radio nationale" or "Radio Burkina." Frequency quote mixed with music, to balafon interval signal at 0000. ID repeat, national anthem to 0003*. (Serra, Italy)

Thanks to our contributors — Have you sent in YOUR logs?
Send to **Gayle Van Horn**, c/o *Monitoring Times* (or e-mail gayle@grove.net)
English broadcast unless otherwise noted.

Top 'o the world to you!

Greetings from "the top of the world!"...says Mike Osborne of KNLS in Anchors Point, Alaska. According to Mike, who sends us his recent station QSL policy, reception reports for KNLS will be verified as quickly as possible by either mail, fax, audio recording, or email. All QSLs will be returned by surface mail.

To qualify, a report must include the date and time (UTC only) of the transmission, the approximate frequency, and as many program details as



Greetings from KNLS, the New Life Station, P.O. Box 473, Anchors Point, Alaska 99556, United States of America

you can supply. KNLS will provide only one QSL for each report, regardless of the number of entries. They do not provide QSLs for other stations who may air World Christian Broadcasting programs.

Have you heard "the top of the world?" Contact KNLS via e-mail: KNLS@aol.com; fax: (615) 371-8791; phone: (615) 371-8791; snail-mail: KNLS, Anchor Point, Alaska 99556 USA.; Internet:

<http://www.hax.com/WCB/AAAINDEX.HTM>.

ASCENSION ISLAND

BBC Atlantic relay station, 17830 kHz. Full data verification letter signed by Nicola Nicholls. Station data sheet enclosed. Received in 244 days for an English report. Station address: English Bay, Ascension Island, South Atlantic. (Stokes Schwartz, Madison, WI)

CHINA

China Radio International, 11717 kHz. Full data QSL card, personal letter and souvenir paper cuts. Received in 57 days for a taped English report and one IRC. Station address: 2 Fuxingmenwaidjie St., Beijing, Rep. of China. (Walter Szczepaniak, Philadelphia, PA) Received same in 27 days for 7405 kHz. (Eric M. Walton, Vancouver, BC Canada)

ECUADOR

Radio Baha'i del Ecuador, 4950 kHz. Full data QSL card with station's stamp and verification letter on station letterhead signed by William Rodriguez B. Received in 63 days for an English report and one U.S. dollar. Station address: Apartado 14, Otavalo, Imbabura, Ecuador. (Darren White, Hattiesburg, MS)

Voz del Upano, 5040 kHz. Partial data *Certificado de Sintonia* QSL card and verification letter on station letterhead signed by P. Domingo Barrveco C. Station calendar enclosed. Received in 76 days for a Spanish report and one U.S. dollar. Station address: 10 de Agosto, Macas, Ecuador. (White, MS)

GUAM

Adventist World Radio/KSDA, 11980 kHz. Full data *Special Edition* QSL card unsigned, plus program schedule and AWR's *Current* newsletter. Received in 34 days for an English report and mint stamps. Station address: AWR-Asia, P.O. Box 7468, Agat, Guam 96928. (Randy Stewart, Springfield, MO)

U.S. Coast Guard Station, 6501 kHz USB. Full data verification letter signed by Michael Scott Bailey-Tel/Comm/Spec 3rd Class. Received in 48 days for an English taped utility report, two IRCs, viewcard and letter. Station address: USCG Marianas Section-Guam, PSC/176 FPO/AP 96540-1056 USA. (Walton, CAN)

ITALY

RAI/Radio Roma, 6005 kHz. Partial data QSL card unsigned. Received in 64 days for an English report, two IRCs, one U.S. dollar and souvenir postcard. Station address: RAI, Casella Postale 320, Centro, Corrispondenza, 00100 Rome, Italy. (Terry Jones, Plankinton, SD)

NEW ZEALAND

Radio New Zealand International, 11900 kHz. Partial

data QSL card, program schedule, station sticker, and promotional booklet. Received in 22 days for an English report, two IRCs and one U.S. dollar. Station address: P.O. Box 123, Wellington, New Zealand. (Jones, SD)

PALAU

KHBN, 9965 kHz. Full data QSL card unsigned. Received in 24 days for an English report and two U.S. dollars. Station address: High Adventure Ministries, KHBN, P.O. Box 66, Koror, Republic of Palau 96940. (Wayne Childress, Helena, MT)

PANAMA

HPP/Panama Intelmar Radio, 12699 kHz USB. Full data station logo QSL card with illegible signature. Received in 35 days for an English utility report, one U.S. dollar and a prepared QSL card (unused). Station address: Casilla 2009, Balboa, Panama. (Stewart, MO)

PERU

Radio Satellite, 6726 kHz. Partial data *Certificado de Sintonia* QSL card with station stamp and full data verification letter on station letterhead signed by Sabino Llaos Chavez-Gerente. Received in 104 days for a Spanish report and one U.S. dollar. Station address: E.I.R. Ltda, Gerente, Jiren Cutervo 543, Provincia, Santa Cruz, Cajamarca, Peru. (White, MS)

PHILIPPINES

VOA Relay, 11870 kHz. Full data QSL card unsigned, plus a 1996 calendar. Received in 48 days for an English report. Station address: c/o QSL Desk, Room G-759, 330 Independence Ave. S.W., Washington, DC 20547. (Childress, MT)

MADAGASCAR

Radio Netherlands relay station, 9605 kHz. Full data limited edition holiday light QSL card unsigned. Received in 31 days for an English report and one U.S. dollar. Station address: P.O. Box 222, 1200JG Hilversum, The Netherlands. (Patrick M. Griffith, Federal Heights, CO)

MEDIUMWAVE

KXBT, 1640 AM kHz. Partial data QSL card signed by Alan-AA6GM. Noted on QSL that KXBT is, "the first expanded band station west of New Jersey." Received in 8 days for an English AM report and one U.S. dollar. Station address: 3267 Sonoma Blvd., Vallejo, CA 94590. (Griffith, CO)

CBC/CBA Radio, 1070 AM kHz. Full data map/logo QSL card signed by Sylvia Roy-Audience Relations. Verification on station letterhead included as well as CBS radio schedule and *Radio Guide*. Received in 62 days for an AM report. Station address: P.O. Box 950, 250

Archibald St., Moncton, NB Canada E1C 8N8 (George Knight, Garfield, NJ)

SEYCHELLES

FEBA Radio, 9810 kHz. Full data QSL card signed. Received in 28 days for an English report and 2 IRCs. Station address: Box 234, Mahe, Seychelles. (Childress, MT)

SHIP TRAFFIC

Sealand Hawaii KIRF, 156.8/156.4 MHz (Container Vessel). Full data prepared QSL card verified, route sheet enclosed. Received in 29 days for an English utility report and mint stamps. Ship address: Sea-Land Service Inc., P.O. Box 2000, Elizabeth, NJ 07207. (Hank Holbrook, MD)

Dixie Commander WBS6455, 156.8/157.025 MHz (Intercoastal Tug & Barge). Full data QSL card verified and photo of vessel. Received in 16 days for an English utility report and mint stamps. Ship address: c/o Dixie Carriers Inc., P.O. Box 880, Harvey, LA 70059. (Holbrook, MD)

SLOVAKIA

Radio Slovakia International, 5930 kHz. Full data *Happy 3rd Birthday* globe/logo card unsigned. Received in 22 days for a taped English report and one U.S. dollar. Station address: Mytna 1, 81290 Bratislava, Slovak Republic. (Szczepaniak, PA)



SURINAME

Radio Apintie, 4990.93 kHz. Full data verification on station letterhead, signed by Ch. E. Vervuurt-General Manager. Tourist brochures enclosed. Received in 65 days for an English report, cassette tape and one U.S. dollar. Station address: P.O. Box 595, Paramaribo, Suriname. (Stewart, MO)

UNITED STATES

WVHA, 5850/15745 kHz. Full data curtain antenna photo QSL card signed by David Evans. Received in 12 days for a taped English report and letter. Station QSL address: c/o Prophecy Countdown, Inc., P.O. Box 1844, Mt. Dora, FL 32757. (Knight, NJ)

HOW TO USE THE SHORTWAVE GUIDE.

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Time) 4, 5, 6, or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (8:30 pm Eastern, 5:30 pm Pacific).

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings except for the "Newline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday A: Saturday
M: Monday W: Wednesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the

station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas	as: Asia
na: North America	au: Australia
ca: Central America	pa: Pacific
sa: South America	va: various
eu: Europe	do: domestic broadcast
af: Africa	om: omnidirectional
me: Middle East	

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

HOT NEWS

WGTG Joins the Baker Brigade.

Patriot Radio now dominates the output of this Christian radio station on 9400 kHz via a linkup with Dr. Jeffrey A. Baker's AmeriNet Broadcasting of Tampa, Florida. (See this month's background feature on the building of WGTG.)

Most programs have a distinct religious flavor while dealing with other matters such as health, financial matters, and survival preparedness. This month's Selected Programs include WGTG's programs for the times normally listed. The remainder of the Mon-Fri schedule is as follows (Sat-Sun all religious):

1700 - Science and Reason
1800 - Blueprint for Survival
1900 - The Preparedness Hour
2000 - Wellness Now
2100 - Financial Surv. in the 90's
2200 - Prophecy in the News

Internet Replaces RTTY Service.

The official Taiwanese Central News Agency (CNA) has dropped its radioteletype service. The service, which used to transmit in English on four shortwave frequencies at 0045-0330 and 0815-1100 UTC, ceased such transmissions at the end of April. CNA now makes its material available on the

Internet via a World Wide Web site (<http://www.cna.com.tw>). The site contains news in English and Chinese and a photo service (*BBC Monitoring*).

We note that the increase in speed is over 500 percent! However, this is a password-protected, pay service; you can get temporary access for examination.

African News

For news from Pan African News Agency (PANA), try Internet URL <http://www.sacs.org.za/level2/pana.htm>. You'll find a searchable database, transcriptions from South Africa radio and television and other items. Best of all, this one is a free service.

BBC Worldwide Update

In a letter to subscribers, the now-defunct magazine announced the decision to close down was due to rising production costs and market research. Readers, they advise, wanted a more listing-based publication. *BBC Worldwide's* replacement will be called *BBC On Air Magazine*. The price will be \$3.50 per issue or \$30 (US) for a one-year subscription. Current subscribers will receive extended subscriptions based on their

expiration dates or refunds. *BBC On Air* will contain up-to-date program and frequency information for

listeners of BBC World Service as well as BBC television. The first issue (June) was not yet received as of May 29th.

Up All Night

Can't sleep during the hot weather or while on vacation? Here's some easy-to-hear (in NAM) shortwave broadcasts with interesting programs:

UTC Times	Broadcaster	Freq 1	Freq 2	Freq 3
0700-0730	Australia	9.860		
0700-0800	BBC (Africa)	6.005		
0700-0800	BBC (Asia Pacific)	7.145		
0700-0800	BBC (Europe)	6.195	7.325	
0700-0800	Costa Rica (RFPI)	7.385		
0700-0800	Japan	7.230		
0700-0800	Taiwan (VOFC)	5.950		
0700-0900	Monitor Radio Int'l	7.535		
0730-0830	Netherlands	9.720	11.895	
0730-0900	Australia	9.580	9.860	6.020
0800-0900	BBC (Europe)	15.400		
0800-1000	BBC (Africa)	15.400	17.830	
0800-1000	WVCR #3	5.065		
0800-1100	New Zealand	6.100		
0830-1030	Netherlands	9.720		
0900-0930	Switzerland	9.885		
0900-0950	Germany	6.160		
0900-1000	Australia	9.860	9.580	9.510
0900-1000	BBC (Americas)	15.190		
0900-1000	BBC (Asia Pacific)	9.740	17.830	
0900-1000	BBC (Europe)	15.400		
0900-1000	Monitor Radio Int'l	7.535	7.395	9.430
0900-1100	Costa Rica (RFPI)	7.385	6.205	
1000-1100	Australia	9.580	9.860	7.240
1000-1100	BBC (Africa)	17.830		
1000-1100	BBC (Americas)	5.965	6.195	15.190
1000-1100	BBC (Asia Pacific)	9.740		
1000-1100	BBC (Europe)	15.070		
1000-1100	Monitor Radio Int'l	7.395	6.095	9.430



Gayle Van Horn, Frequency Manager

North Carolina

swbcsked@grove.net

Dave Datko

California

Lloyd Van Horn

Brasstown, N.C.

MT MONITORING TEAM

Next Reporting Deadline

July 18, 1996

Jim Frimmel, Program Manager

Texas

DXComp@aol.com

Jacques d'Avignon

Propagation Forecasts

Ontario, Canada

monitor@limestone.kosone.com

Newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC

(8:00 PM EDT, 5:00 PM PDT)

BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (south as)
Canada (North-Quebec)
China Radio Intl
Monitor Radio Intl [T-A]
Radio Australia
Radio Exterior de Espana
Radio New Zealand Intl
Radio Prague
Radio Thailand
Radio Ukraine Intl
Radio Yugoslavia [M-A]
Voice of America (am)
Voice of America (as)
Voice of America (ca)
Voice of Russia
WWCR #4 (Tennessee) [T-A]
0001
Croatian Radio
0003
Radio Pyongyang
0010
China Radio Intl*
Voice of America (ca) [T-A]*
0015
Radio Cairo
0030
All India Radio
Radio Netherlands Intl
Radio Sweden [T-A]
Radio Thailand [T-S]
Radio Vilnius [M-A]
Voice of America (am) [T-S]
(Special English)
Voice of America (as) (Special English)
Voice of Russia
0035
Voice of Iran
0045
BBC (am)*
BBC (as pac)*
BBC (south as)*
0050
RAI Intl Italy

0100 UTC

(9:00 PM EDT, 6:00 PM PDT)

BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (south as) (Newsdesk)
Canada (North-Quebec) [S]
Deutsche Welle
HCJB (am)
Monitor Radio Intl [T-A]
Radio Australia
Radio Budapest
Radio Canada Intl
Radio Exterior de Espana
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Intl

Radio Norway Intl [M]
Radio Prague
Radio Sweden [T-A]
Radio Tashkent
Swiss Radio Intl
Voice of America (am)
Voice of America (as)
Voice of America (ca)
Voice of Indonesia [F]
Voice of Russia
Voice of Vietnam
0101
Croatian Radio
0102
R Slovakia Intl*
0110
Radio Australia [M-F]*
0113
Radio Havana Cuba [T-S]*
0130
BBC (as pac)
BBC (south as) [A-M]
Radio Austria Intl
Radio Havana Cuba [T-S]
Radio Netherlands Intl
Radio Sweden [T-A]
Voice of Greece
Voice of Russia [T-A]
Voice of Vietnam
0145
Radio Tirana
0152
Vatican Radio
0155
Radio Canada Intl [T-A]
Voice of Indonesia [F]

0200 UTC

(10:00 PM EDT, 7:00 PM PDT)

BBC (af) (Newsday)
BBC (am) (Newsday)
BBC (as pac) (Newsday)
BBC (eu) (Newsday)
BBC (south as) (Newsday)
Canada (North-Quebec)
Deutsche Welle
Monitor Radio Intl [T-A]
Radio Australia
Radio Canada Intl
Radio Havana Cuba [T-S]
Radio Korea
Radio New Zealand Intl [T-A]
Radio Romania Intl
RAE Argentina [T-A]
Voice of America (as)
Voice of Myanmar (Burma)
Voice of Russia
Voice of Vietnam
WHRI (Angel 2) [T-A]
WWCR #3 (Tennessee) [T-A]
WWCR #4 (Tennessee) [T-A]
0201
Croatian Radio

0203

Voice of Free China
0213
Radio Havana Cuba [T-S]*
0215
Radio Cairo
Radio Nepal
0230
Radio Austria Intl
Radio Budapest
Radio Havana Cuba [T-S]
Radio Netherlands Intl
Radio Pakistan
Radio Portugal Intl [T-A]
Radio Sweden [T-A]
Radio Tirana
Voice of Russia
Voice of Vietnam

0300 UTC

(11:00 PM EDT, 8:00 PM PDT)

BBC (af)
BBC (am)
BBC (as pac)
BBC (eu) [S-F]
BBC (south as)
Canada (North-Quebec)
Channel Africa
China Radio Intl
Deutsche Welle
Monitor Radio Intl [T-A]
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Intl [M-A]
Radio Prague
Radio Thailand
Radio Ukraine Intl
Voice of America (af) [A-S]
Voice of Russia
Voice of Turkey
WHRI (Angel 2) [T-A]
WWCR #3 (Tennessee) [T-A]
WWCR #4 (Tennessee) [T-A]
0301
Croatian Radio
Voice of America (af) [M-F]*
0303
Voice of Free China
0310
China Radio Intl*
0313
Radio Havana Cuba [T-S]*
0315
Radio Cairo
0320
Radio Philipinas [M-A]
Vatican Radio [T-S]
0330
BBC (af) [A-S]*
BBC (eu) [A]
Radio Dubai
Radio Havana Cuba [T-S]
Radio Prague

Radio Sweden [T-A]

Voice of America (af) [M-F]
(Special English)
Voice of Russia
0340
Voice of Greece
0355
Radio Japan [W-M]

0400 UTC

(12:00 AM EDT, 9:00 PM PDT)

BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) [S-F] (Newsdesk)
BBC (south as) (Newsdesk)
Canada (North-Quebec)
Channel Africa
China Radio Intl
Deutsche Welle
Monitor Radio Intl [T-A]
Radio Australia
Radio Bulgaria
Radio Canada Intl
Radio Havana Cuba [T-S]
Radio New Zealand Intl [A]
Radio New Zealand Intl [M-F]*
Radio Norway Intl [M]
Radio Romania Intl
Radio Tanzania
Swiss Radio Intl
Voice of America (af)
Voice of America (me)
Voice of Israel
Voice of Russia
WWCR #4 (Tennessee) [T-A]
WYFR (Satellite Network) [A]
ZBC Zimbabwe
0401
Croatian Radio
0403
Radio Pyongyang
0410
China Radio Intl*
0413
Radio Havana Cuba [T-S]*
0425
RAI Intl Italy
0430
BBC (af) [A-S]*
BBC (eu) [A] (Newsdesk)
Radio Havana Cuba [T-A]
Radio Netherlands Intl
Radio Yugoslavia
Voice of Russia
0431
Voice of America (af) [M-F]*

0500 UTC

(1:00 AM EDT, 10:00 PM PDT)

AWR Latin America [T-A]*
BBC (af) (Newsday)
BBC (am) (Newsday)

BBC (as pac) (Newsday)
BBC (eu) (Newsday)
BBC (south as) (Newsday)
Canada (North-Quebec)
Channel Africa
Deutsche Welle
HCJB (am)
Monitor Radio Intl [T-F]
Radio Australia
Radio Cameroon
Radio Canada Intl [M-F]
Radio Exterior de Espana
Radio Havana Cuba [T-S]
Radio Japan
Radio New Zealand Intl [S-F]
Radio Norway [A]
Voice of America (af)
Voice of America (me)
Voice of Russia
WWCR #1 (Tennessee) [T-A]
0510
Radio Australia [M-F]*
0513
Radio Havana Cuba [T-S]*
0530
BBC (af) [A-S]*
Radio Austria Intl
Radio Havana Cuba [T-A]
Radio Romania Intl
Voice of Nigeria
Voice of Russia
0555
Radio Japan [A]

0600 UTC

(2:00 AM EDT, 11:00 PM PDT)

BBC (af)
BBC (am) [M-A]
BBC (as pac)
BBC (eu)
BBC (south as)
Deutsche Welle
Monitor Radio Intl [T-F]
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio New Zealand Intl [M-A]
Radio Norway Intl [S]
Swiss Radio Intl
Voice of America (af) [A-S]
Voice of America (me)
Voice of Kenya
Voice of Russia
WWCR #1 (Tennessee) [S]
WWCR #3 (Tennessee) [M-F]
0601
Voice of America (af) [M-F]*
0603
Radio Pyongyang
0613
Radio Havana Cuba [T-S]*
0615
Swiss Radio Intl (eu)

0630
BBC (af) [A-S]*
Radio Austria Intl
Radio Havana Cuba [T-S]
Radio Vlaanderen Intl
Vatican Radio [H]
Voice of Nigeria [M-F]
Voice of Russia
0631
Radio Romania Intl
0645
Radio Romania Intl
Voice of Nigeria [T-F]*
0655
Radio Japan [W-M]

0700 UTC (3:00 AM EDT, 12:00 AM PDT)

BBC (af)
BBC (as pac)
BBC (eu)
BBC (south as)
Monitor Radio Intl [T-F]
Papua New Guinea
Radio Australia
Radio Japan
Radio New Zealand Intl [M-A]
Radio Prague
Voice of Malaysia
Voice of Myanmar (Burma)
Voice of Russia
WWCR #3 (Tennessee) [M-F]
0703
Croatian Radio
Radio Pyongyang
Voice of Free China
0710
Radio Australia [M-F]*
0715
Swiss Radio Intl (eu)
0717
Radio New Zealand Intl [H]*
0730
HCJB (eu)
Radio Austria Intl
Radio Netherlands Intl
Voice of Greece
Voice of Russia [T-A]
0750
Russia (Radio Pacific Ocean)
[A]
0755
Radio Japan

0800 UTC (4:00 AM EDT, 1:00 AM PDT)

BBC (af)
BBC (as pac)
BBC (eu)
BBC (south as)
KNLS (Alaska)
Monitor Radio Intl [M-A]
Radio Australia
Radio Korea
Radio New Zealand Intl
Radio Norway Intl [S]
Radio Pakistan
Voice of Indonesia [A-H]
Voice of Malaysia
Voice of Russia
0803
Croatian Radio
Radio Pyongyang
0810
Radio New Zealand Intl [M-F]*
0830
R Slovakia Intl [W-M]
Radio Netherlands Intl
Voice of Russia
0832
R Slovakia Intl [T]*

0855
Voice of Indonesia [A-H]

0900 UTC (5:00 AM EDT, 2:00 AM PDT)

BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
China Radio Intl
Deutsche Welle
HCJB (pac)
Monitor Radio Intl [M-A]
Papua New Guinea [M]*
Radio Australia
Radio Japan
Radio New Zealand Intl [M-A]
Radio Prague
Radio Vlaanderen Intl [M-A]
Swiss Radio Intl
Voice of Russia
WWCR #1 (Tennessee) [M-F]
0903
Croatian Radio
0910
China Radio Intl*
Radio Australia [M-F]*
0930
FEBC (Philippines) [M-A]
Radio Austria Intl [M-A]
Radio Finland
Radio Netherlands Intl
Voice of Russia
0945
Deutsche Welle [M-F]*
0955
Radio Japan

1000 UTC (6:00 AM EDT, 3:00 AM PDT)

All India Radio
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
China Radio Intl
Monitor Radio Intl
Papua New Guinea
Radio Australia
Radio New Zealand Intl [S-F]
Radio Tanzania
Voice of America (as)
Voice of America (ca)
Voice of Kenya
Voice of Russia
Voice of Vietnam
WHRI (Angel 2) [A]
WYFR (Satellite Network) [M-A]
1010
China Radio Intl*
1015
Radio New Zealand Intl [M-F]*
1020
Radio New Zealand Intl [H]*
Vatican Radio [M-A]
1030
FEBC (Philippines) [M-F]*
Radio Austria Intl
Radio Dubai
Radio Finland
Radio Netherlands Intl
Radio Prague
Voice of Nigeria
Voice of Russia
1045
Voice of Nigeria [A-S]*

1100 UTC (7:00 AM EDT, 4:00 AM PDT)

BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
BBC (south as) (Newsdesk)
Canada (North-Quebec) [A-S]
Deutsche Welle
Monitor Radio Intl [M-A]
Papua New Guinea
Radio Australia
Radio Ghana [A-S]
Radio Japan
Radio New Zealand Intl (Newsdesk)
Radio Pakistan
Radio Singapore Intl
Swiss Radio Intl
Swiss Radio Intl (eu)
Voice of America (as)
Voice of America (ca)
Voice of Russia
WGTG (Georgia) [A]
WHRI (Angel 2) [A]
WWCR #1 (Tennessee) [A]
WYFR (Satellite Network) [M-F]
1102
Radio Mozambique
1103
Radio Pyongyang
1110
Radio Australia*
1130
Radio Austria Intl
Radio Bulgaria
Radio Finland [M-F]
Radio Korea
Radio Netherlands Intl
Radio Singapore Intl
Radio Sweden [M-F]
Voice of Asia
Voice of Russia
WYFR (Satellite Network) [M-F]
1135
Voice of Iran
1145
Deutsche Welle [M-F]*
1155
Radio Japan [S-F]

1200 UTC (8:00 AM EDT, 5:00 AM PDT)

BBC (af) [M-A]
BBC (am)
BBC (as pac) [M-A]
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A-S]
China Radio Intl
Monitor Radio Intl [M-A]
Papua New Guinea
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio Canada Intl
Radio France Intl
Radio Jordan
Radio Korea
Radio New Zealand Intl [H-T]
Radio Norway Intl [S]
Radio Singapore Intl
Radio Tashkent
Voice of America (as)
Voice of Russia
WGTG (Georgia) [M-A]
WYFR (Satellite Network) [M-F]
1203
Voice of Free China

1204
HCJB (am) [M-F]
1210
China Radio Intl*
1215
BBC (af) [M-A]*
BBC (as pac) [M-F]*
BBC (eu)*
BBC (south as) [M-A]*
1230
HCJB (am) [M-F]*
Radio Bangladesh [S-M]
Radio Bulgaria
Radio Cairo
Radio Canada Intl
Radio Finland
Radio Korea [S-W/A]
Radio Netherlands Intl
Radio Singapore Intl
Radio Sweden [M-F]
Radio Vlaanderen Intl [S]
Voice of Russia [M-A]
Voice of Turkey
Voice of Vietnam
WYFR (Satellite Network) [M-F]
1231
Radio France Intl [T]*
1240
Voice of Greece

1300 UTC (9:00 AM EDT, 6:00 AM PDT)

BBC (af) (Newshour)
BBC (am) (Newshour)
BBC (as pac) (Newshour)
BBC (eu) (Newshour)
BBC (south as) (Newshour)
Canada (North-Quebec) [A-S]
China Radio Intl
KNLS (Alaska)
Monitor Radio Intl [M-A]
Papua New Guinea
Radio Australia
Radio Canada Intl [S-F]
Radio Ghana
Radio Norway Intl [S]
Radio Prague
Radio Romania Intl
Radio Singapore Intl
Radio Tanzania [A-S]
Radio Vlaanderen Intl [M-A]
Swiss Radio Intl
Swiss Radio Intl (eu)
Voice of America (as)
Voice of Kenya
Voice of Russia
WGTG (Georgia) [S-F]
WHRI (Angel 2) [M-F]
WYFR (Satellite Network) [M-F]
1303
Croatian Radio
Radio Pyongyang
1310
China Radio Intl*
Radiobras [M-F]*
1324
HCJB (am) [M-F]
1328
Radio Cairo
1330
All India Radio
FEBC (Philippines) [M-A]
Radio Austria Intl
Radio Canada Intl
Radio Dubai
Radio Netherlands Intl
Radio Singapore Intl [T-S]
Radio Sweden [M-F]
Radio Tashkent
Radio Yugoslavia

Voice of America (as) (Special English)
Voice of Russia
Voice of Vietnam
1335
FEBC (Philippines) [M-F]*
Voice of Greece
1355
Radio Singapore Intl [A-S]
Radio Singapore Intl [M-F]*

1400 UTC (10:00 AM EDT, 7:00 AM PDT)

BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A-S]
China Radio Intl
Monitor Radio Intl [M-A]
Radio Australia
Radio Cameroon
Radio Canada Intl [S]
Radio France Intl
Radio Ghana
Radio Japan
Radio Pakistan
Voice of America (as)
Voice of America (me)
Voice of Israel
Voice of Russia
WGTG (Georgia) [A]
WWCR #3 (Tennessee) [M-F]
1410
China Radio Intl*
1415
Radio Nepal
1424
HCJB (am) [M-F]
1430
FEBC (Philippines) [M-A]
Radio Netherlands Intl
Radio Romania Intl
RTM Morocco [S]
Voice of Myanmar (Burma)
Voice of Russia
WYFR (Satellite Network) [M-F]
1431
Radio France Intl [T]*
1445
All India Radio
Voice of Myanmar (Burma)
1455
Radio Japan [A]

1500 UTC (11:00 AM EDT, 8:00 AM PDT)

BBC (af)
BBC (am)
BBC (as pac) [A-S]
BBC (eu)
BBC (south as)
Canada (North-Quebec) [A-S]
Channel Africa
China Radio Intl
Estonian Radio [M-F]
Monitor Radio Intl [M-A]
Radio Australia
Radio Canada Intl [S]
Radio Japan
Swiss Radio Intl
Voice of America (as)
Voice of America (me)
Voice of Russia
WWCR #1 (Tennessee) [M-F]
WWCR #3 (Tennessee) [M-F]
WYFR (Satellite Network) [A]



1503
Radio Pyongyang
1510
China Radio Intl [W-M]*
1511
China Radio Intl [T]*
1530
All India Radio*
FEBA (Seychelles)
FEBC (Philippines) [M-A]
Radio Austria Intl
Radio Netherlands Intl
Radio Portugal Intl [M-F]
Voice of Nigeria [M-F]
Voice of Russia
1535
Voice of Iran
1555
Radio Japan [A]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu) [A]
BBC (south as)
Canada (North-Quebec) [A]
Channel Africa
China Radio Intl
Deutsche Welle
Monitor Radio Intl [M-A]
Radio Australia
Radio France Intl
Radio Jordan
Radio Korea
Radio Norway Intl [S]
Radio Pakistan
Radio Prague
Radio Tanzania
Voice of America (af) [A-S]
Voice of America (as)
Voice of America (me)
Voice of Ethiopia
Voice of Kenya
Voice of Russia
Voice of Vietnam
WHRI (Angel 1) [M-A]
WHRI (Angel 2) [A]
WRNO (Louisiana) [M-F]
WWCR #3 (Tennessee) [M-A]
WWCR #4 (Tennessee) [M-F]
WYFR (Satellite Network) [M-A]
1610
China Radio Intl*
1612
Vatican Radio [S-F]
1615
Radio Tirana
Vatican Radio
1630
Channel Africa [F]*
R Slovakia Intl [T-S]
Radio Canada Intl
Radio Dubai
Voice of America (af) [M-F]*
Voice of America (as) (Special English)
Voice of America (me) (Special English)
Voice of Ethiopia
Voice of Russia [S-F]
1632
R Slovakia Intl [M]*
1633
Deutsche Welle [M]*
1638
Deutsche Welle [T-F]*
1645
BBC (am) [S-F]*

BBC (as pac) [M-F]*
BBC (eu) [M-F]*
Radio Canada Intl [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu) [M-A]
BBC (south as)
Canada (North-Quebec) [A]
Channel Africa
China Radio Intl
Monitor Radio Intl [M-A]
Polish Radio [A]
Polish Radio [M-F]*
Radio Australia
Radio France Intl
Radio Japan
Radio Jordan
Radio New Zealand Intl [M-F]*
Radio Pakistan
Radio Prague
Swiss Radio Intl
Voice of America (af)
Voice of America (as)
Voice of America (me)
Voice of Russia
WRNO (Louisiana) [M-F]
WWCR #3 (Tennessee) [M-A]
WWCR #4 (Tennessee) [M-F]
1703
Radio Pyongyang
1710
China Radio Intl*
Radio Australia*
1730
Radio Austria Intl
Radio Netherlands Intl
Radio New Zealand Intl [M-F]*
Radio Romania Intl
Voice of Russia
WHRI (Angel 1) [M-F]
1740
BBC (af)*
1745
Voice of Armenia

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
BBC (south as) (Newsdesk)
Monitor Radio Intl [M-A]
Radio Australia
Radio Cameroon
Radio New Zealand Intl [M-F]*
Radio Norway Intl [S]
Radio Omdurman
Radio Tanzania
Radio Vlaanderen Intl
Radio Yemen
Swiss Radio Intl (eu)
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Kenya
Voice of Russia
Voice of Vietnam
WHRI (Angel 1) [M-F]
1802
Radio Mozambique
1830
BBC (af) [A-S]*
R Slovakia Intl [T-S]
Radio Bangladesh
Radio Korea [S-W/A]

Radio Kuwait
Radio Netherlands Intl
Radio New Zealand Intl [M-F]*
Radio Sweden [M-F]
Radio Tirana
Radio Yemen
Radio Yugoslavia
Voice of America (af) [A-S]
(Special English)
Voice of America (me) (Special English)
Voice of Russia
Voice of Turkey
1832
R Slovakia Intl [M]*
1840
Voice of Greece [M-A]
1855
Radio New Zealand Intl [M]*

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio
BBC (af)
BBC (as pac) (Newshour)
BBC (eu) (Newshour)
China Radio Intl
Deutsche Welle
Estonian Radio [M/H]
HCJB (eu)
Monitor Radio Intl [M-A]
Radio Australia
Radio Budapest
Radio Bulgaria
Radio Japan
Radio Korea
Radio New Zealand Intl
Radio Romania Intl
Radio Vilnius
Voice of America (af)
Voice of America (as)
Voice of America (me)
Voice of Israel
Voice of Russia
Voice of Vietnam
WHRI (Angel 1) [M-F]
WWCR #3 (Tennessee) [M-F]
WWCR #4 (Tennessee) [M-A]
1910
China Radio Intl*
Radio Australia [M-F]*
Radiobras [M-F]*
1930
Deutsche Welle [M-F]*
Polish Radio [A-S]
Polish Radio [M-F]*
Radio Austria Intl
Radio Netherlands Intl
Radio New Zealand Intl [S-H]*
Radio Sweden [M-F]
1935
RAI Intl Italy
Voice of Iran

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC (af) (Newshour)
BBC (am)
BBC (as pac)
BBC (eu)
China Radio Intl
Deutsche Welle
Monitor Radio Intl [M-A]
Radio Australia
Radio Canada Intl
Radio Korea
Radio New Zealand Intl
Radio Norway Intl [S]
Radio Portugal Intl [M-F]
Radio Prague
Swiss Radio Intl

Swiss Radio Intl (eu)
Voice of America (af) [A-S]
Voice of America (af) [M-F]*
Voice of America (me)
Voice of Greece [M-A]
Voice of Indonesia
Voice of Nigeria [M-F]
Voice of Russia
WHRI (Angel 1) [M-F]
WHRI (Angel 2) [M-F]
WWCR #4 (Tennessee) [M-F]
2003
Radio Pyongyang
2007
Radio Damascus [S-F]
2010
China Radio Intl*
2025
RAI Intl Italy
2030
Radio Dnestr (Moldova) [M/W-H/A]
Radio Finland
Radio Netherlands Intl
Radio New Zealand Intl [S-H]*
Radio Riga Intl [M-F]
Radio Thailand
Radio Yugoslavia
Voice of Armenia
Voice of Russia
Voice of Vietnam
2055
Radio Canada Intl [M-F]
Voice of Indonesia [M]
2057
Radio Kuwait

2100 UTC
(5:00 PM EDT, 2:00 PM PDT)
All India Radio
BBC (af)
BBC (am)
BBC (as pac)
BBC (eu)
Canada (North-Quebec) [A-S]
China Radio Intl
Deutsche Welle
Monitor Radio Intl [M-A]
Radio Australia
Radio Budapest
Radio Bulgaria
Radio Cameroon
Radio Canada Intl
Radio Exterior de Espana
Radio Havana Cuba [M-A]
Radio Japan
Radio Korea
Radio New Zealand Intl [A-M/H]
Radio Romania Intl
Radio Ukraine Intl
Radio Vlaanderen Intl
Radio Yugoslavia
Voice of America (af)
Voice of America (as)
Voice of America (me)
Voice of Russia
WHRI (Angel 2) [M-F]
WWCR #1 (Tennessee) [M-W/F]
WWCR #4 (Tennessee) [M-F]
2110
China Radio Intl*
2113
Radio Damascus
2115
BBC (af)*
BBC (eu)*
2120
Radio Cairo
2130
Radio Cairo

Radio Havana Cuba [M-A]*
Radio New Zealand Intl [S-H]*
Radio Sweden [M-F]
Voice of Russia [M-F]
2135
Voice of Iran

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC (af) (Newsdesk)
BBC (am) (Newsdesk)
BBC (as pac) (Newsdesk)
BBC (eu) (Newsdesk)
Canada (North-Quebec) [S]
China Radio Intl
Monitor Radio Intl [M-A]
Radio Australia
Radio Canada Intl
Radio Havana Cuba [M-A]
Radio New Zealand Intl [A-H]
Radio Norway Intl [S]
RAI Intl Italy
Voice of America (as)
Voice of Russia
Voice of Turkey
WHRI (Angel 2) [M-F]
WWCR #1 (Tennessee) [M-F]
WWCR #3 (Tennessee) [S-F]
WWCR #4 (Tennessee) [S-F]
2203
Croatian Radio
Voice of Free China
2210
China Radio Intl*
2215
Radio Cairo
2230
Radio Austria Intl
Radio Havana Cuba [M-A]*
Radio Prague
Voice of America (as) (Special English)
Voice of Russia
2240
Radio Cairo
Voice of Greece [S-F]

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
All India Radio
BBC (af) [S-F]
BBC (am) [S-F]
BBC (as pac)
BBC (eu) [S-F]
Canada (North-Quebec) [A]
Deutsche Welle
KWHR (Hawaii) [M-F]
Monitor Radio Intl [M-A]
Radio Australia
Radio Bulgaria
Radio Canada Intl
Radio Japan
Radio New Zealand Intl [F-A]
Radio Romania Intl
Voice of America (as)
Voice of Russia
WHRI (Angel 2) [M-F]
WWCR #4 (Tennessee) [M-F]
2301
Croatian Radio
2303
Radio Pyongyang
2315
Radio Cairo
2330
Radio Netherlands Intl
Radio New Zealand Intl [S-H]
Radio Vlaanderen Intl
Voice of Russia
Voice of Vietnam
2335
Voice of Greece [S-F]

Note on advertisement below: As of 4/26/95 it became unlawful to market cellular-capable receivers in the US. Atlantic Ham Radio assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.

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- CYBERSCAN function allows scan file tracking control of systems employing frequency hopping techniques.
- Spectrum log at speeds in excess of 1300 channels a minute, generate a real time histogram of activity and create scan database file automatically.
- Birdie log during frequency search automatically characterizes your R7000, then locks out those frequencies.



- Activity log function continuously monitors and logs all frequencies of a scan database while displaying active, was active and never active channels.

Optional DELTACOMM™ DSS (Digital Signal Strength) upgrade for your DELTACOMM™ I-7000 communication manager.

- Innovative interface design allows digitizing and storing the R7000 signal level information with 8-bit accuracy via your computer's game/joystick port.
- DSS allows user programmable upper and/or lower signal level detection limits during DELTACOMM™ I-7000's spectrum log, scan and search functions.
- Log signal strength information to printer or delimited log file while DELTACOMM™ I-7000 is scanning or activity logging the selected database file.

DELTACOMM™ I-7000 communication manager program includes all cabling, manual, UL listed power supply and Delta Research custom CI-V interface for \$299.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H. The DELTACOMM™ DSS interface upgrade comes complete with easy to follow NO SOLDER installation instructions, all cabling and 8-bit DSS A/D converter module (game port required) for \$99.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H and is available as an upgrade option to registered I-7000 users. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7100, R71A, R72 and IC735.



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FREQUENCIES

0100-0200	Australia, Radio	11855as 15240pa 17705as	13605pa 15365pa 17795pa	13745as 15415as 15510as	13755pa	0100-0130	Serbia, Radio Yugoslavia	6195na	7130na		
0100-0200 vl	Australia, VL8A Alice Spg	2310do				0100-0130	Slovakia, R Slovakia Intl	5930na	7300na	9440na	
0100-0200 vl	Australia, VL8K Katherine	5025do				0100-0200	Spain, R Exterior Espana	9540na			
0100-0200 vl	Australia, VL8T Tent Crk	4910do				0100-0200	Sri Lanka, Sri Lanka BC	15425as			
0100-0200	Australia, Defense Forces R	13525as				0100-0130	Switzerland, Swiss R Intl	6135na	9885na	9905ca	6175va
0100-0200 vl	Canada, CBC N Quebec Svc	9625do				0100-0200	United Kingdom, BBC WS	5965as	5970sa	5975va	6175va
0100-0200	Canada, CFCX Montreal	6005do						6195as	7265as	7325va	9560va
0100-0200	Canada, CFRX Toronto	6070do						9590va	9915va	11750sa	11955as
0100-0200	Canada, CFVP Calgary	6030do				0100-0200	USA, KAIJ Dallas TX	15360as			
0100-0200	Canada, CHNX Halifax	6130do				0100-0200	USA, KTNB Salt Lk City UT	5810am	9815am		
0100-0200	Canada, CKZN St John's	6160do				0100-0200	USA, KVOH Los Angeles CA	7510am			
0100-0200	Canada, CKZU Vancouver	6160do				0100-0200	USA, KWHR Naalehu HI	9975am			
0100-0159	Canada, R Canada Intl	6120am 13670am	9535am	9755am	11715am	0100-0200	USA, Monitor Radio Intl	17510au			
0100-0200	Costa Rica, RF Peace Intl	6205am	7385am			0100-0200	USA, Voice of America	7535na	9430am		
0100-0200	Cuba, Radio Havana	6000na	9820na	9830na				5995am	6130am	7115as	7205as
0100-0127	Czech Rep, Radio Prague	6200na	7345na					7405am	9455am	9635as	9775am
0100-0200	Ecuador, HCJB	9745am	21455va					11705as	11725as	13740am	15170as
0100-0150	Germany, Deutsche Welle	6040na 11740na	6085na	6145na	9640na			15205as	15250as	17740as	17820as
0100-0115	Ghana, Ghana Broadc Corp	3366do	4915do			0100-0200	USA, WEWN Birmingham AL	5825eu			
0100-0130	Hungary, Radio Budapest	9840na	11870na			0100-0200	USA, WGTG McCaysville GA	9400am			
0100-0200	Indonesia, Voice of	9525na				0100-0200	USA, WHRI Noblesville IN	5745am			
0100-0128	Iran, VOIRI	6050na	9022na	9685am		0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0110	Italy, RAI Intl	6005na	9675na	11800na		0100-0130 m	USA, WRMI/R Miami Intl	9955am			
0100-0200	Japan, NHK/Radio	5960na 11885as 17845as	11790as 11890as	11840as 11910as	11860as 17810as	0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	Lebanon, Wings of Hope	9960va				0100-0200	USA, WWCR Nashville TN	3230am	5065am	5935am	7435am
0100-0200 smtwh	Malaysia, Radio	7295do				0100-0200	USA, WYFR Okeechobee FL	6065na			
0100-0125	Netherlands, Radio	5905na	7305na	9845na		0100-0120	Uzbekistan, R Tashkent	5955as	5975as	7285as	
0100-0200	New Zealand, R NZ Intl	15115pa				0100-0200	Vietnam, Voice of	5940na	7250na	9840na	14355na
0100-0130 m	Norway, Radio Norway Intl	9560na						15010na			
0100-0200 vl	Papua New Guinea, NBC	9675do				0103-0110	Croatia, Croatian Radio	5895eu	7165eu		
0100-0200	Philippines, FEBC/R Intl	15450as				0104-0200	USA, WYFR Okeechobee FL	9505na			
0100-0200	Russia, Voice of Russia WS	7070na 12050na	7240na 13665na	9620na 15180na	12010na 15580na	0115-0130 f	Greece, Voice of	7448na	9420na	9935na	

SELECTED PROGRAMS

Sundays

- 0100 USA, WEWN Birmingham AL: St. Joseph Radio Presents. A discussion of Catholic beliefs and practices for all denominations (repeat).
- 0100 Costa Rica, R Peace Intl: FIRE (Feminist Int'l Radio Endeavour). Featuring women's voices on every imaginable topic.
- 0100 USA, KVOH Los Angeles CA: Strength for the Day. A time of meditation.
- 0100 USA, WRNO, New Orleans LA: American Dissident Voices. The fascist point of view is expounded.
- 0105 Switzerland, Swiss R Intl: Newsnet. Ten minutes of comment and backgrounders from correspondents; 15 minutes on what's happening in Switzerland.
- 0115 Switzerland, Swiss R Intl: Capital Letters (2/4). SRI's bimonthly mailbag and listener contact program.
- 0115 Switzerland, Swiss R Intl: The Name Game (1/3/5). A chance for you to test your knowledge of Switzerland and win prizes.
- 0115 USA, KVOH Los Angeles CA: Answers. Pat Robertson.
- 0125 Netherlands, Radio: Program Info. Summary of upcoming program schedules.
- 0130 USA, WRNO, New Orleans LA: Herald of Truth. Bible-based solutions to personal and national problems.
- 0145 USA, WRNO, New Orleans LA: Jazz. Non-stop modern and progressive jazz.

Mondays

- 0100 USA, WEWN Birmingham AL: St. Joseph Radio Presents. See S 0100.
- 0100 Costa Rica, R Peace Intl: FIRE (Feminist Int'l Radio Endeavour). See S 0100.
- 0100 Philippines, FEBC Manila: Guidelines for Living. Bringing the physical truth and psychological impact to living.
- 0100 USA, WRNO, New Orleans LA: World of Prophecy. Texe Marrs and a guest discuss the evils and pitfalls of today and the outlook for tomorrow.
- 0104 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0106 Czech Rep, Radio Prague: The Week and Politics. See S 1236.
- 0113 Czech Rep, Radio Prague: From the Weeklies. See S 1243.
- 0119 Czech Rep, Radio Prague: What's Up. See S 1249.
- 0125 Netherlands, Radio: Program Info. See S 0125.
- 0138 Netherlands, Radio: Wide Angle. See S 1238.
- 0154 Netherlands, Radio: Siren Song. See S 1254.

Tuesdays

- 0100 USA, WEWN Birmingham AL: St. Joseph Radio Presents. See S 0100.
- 0100 Costa Rica, R Peace Intl: FIRE (Feminist Int'l Radio Endeavour). See S 0100.
- 0100 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 0100 USA, KVOH Los Angeles CA: Strength for the Day. A time of meditation.
- 0104 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0109 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0120 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0125 Netherlands, Radio: Program Info. See S 0125.
- 0138 Netherlands, Radio: Newsline. See S 0038.
- 0153 Netherlands, Radio: A Good Life. See M 1253.

Wednesdays

- 0100 USA, WEWN Birmingham AL: St. Joseph Radio Presents. See S 0100.
- 0100 Costa Rica, R Peace Intl: FIRE (Feminist Int'l Radio Endeavour). See S 0100.
- 0100 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 0100 USA, KVOH Los Angeles CA: Strength for the Day. A time of meditation.
- 0105 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0120 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0123 Czech Rep, Radio Prague: What's Up. See S 1249.
- 0125 Netherlands, Radio: Program Info. See S 0125.
- 0138 Netherlands, Radio: Newsline. See S 0038.
- 0153 Netherlands, Radio: African Season. See T 1253.

Thursdays

- 0100 USA, WEWN Birmingham AL: LiveWire (live). Live call-in program.
- 0100 Costa Rica, R Peace Intl: FIRE (Feminist Int'l Radio Endeavour). See S 0100.
- 0100 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 0100 USA, KVOH Los Angeles CA: Strength for the Day. A time of meditation.
- 0105 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0110 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0113 Czech Rep, Radio Prague: From the Archives. See W 1313.
- 0120 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.

- 0121 Czech Rep, Radio Prague: The Arts. See W 1321.
- 0125 Netherlands, Radio: Program Info. See S 0125.
- 0138 Netherlands, Radio: Newsline. See S 0038.
- 0153 Netherlands, Radio: Media Network. Jonathan Marks and Diana Janssen look at the world of broadcasting. Top-rated.

Fridays

- 0100 USA, WEWN Birmingham AL: St. Joseph Radio Presents. See S 0100.
- 0100 Costa Rica, R Peace Intl: FIRE (Feminist Int'l Radio Endeavour). See S 0100.
- 0100 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 0100 USA, KVOH Los Angeles CA: Strength for the Day. A time of meditation.
- 0105 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0109 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0117 Czech Rep, Radio Prague: I'd Like You to Meet. See F 1319.
- 0120 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0125 Netherlands, Radio: Program Info. See S 0125.
- 0138 Netherlands, Radio: Newsline. See S 0038.
- 0153 Netherlands, Radio: Research File. See M 1153.

Saturdays

- 0100 USA, WEWN Birmingham AL: St. Joseph Radio Presents. See S 0100.
- 0100 Costa Rica, R Peace Intl: FIRE (Feminist Int'l Radio Endeavour). See S 0100.
- 0100 USA, KVOH Los Angeles CA: Strength for the Day. A time of meditation.
- 0105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0106 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0111 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0114 Czech Rep, Radio Prague: Calling All Listeners. See F 1314.
- 0125 Netherlands, Radio: Program Info. See S 0125.
- 0138 Netherlands, Radio: Newsline. See S 0038.
- 0154 Netherlands, Radio: From Sapphire to Laser. See F 1253.
- 0154 Radio Netherlands: Documentary (1). Lessons in Revolution (6th). See W 1154. (2). Preparing for Atlanta — Part 1 (13th). Howard Shannon looks at how Dutch athletes have been readying themselves. (3). Preparing for Atlanta — Part 2 (20th). See F 1454. (4). Living on the Land — Part 1 (27th). See F 2354. (5). Living on the Land — Part 2 (3 Jul). See H 0054.

FREQUENCIES

0200-0300 twfha	Argentina, RAE	11710am				0200-0300	Sri Lanka, Sri Lanka BC	15425as			
0200-0300	Australia, Radio	13605pa	13755pa	15240pa	15365pa	0200-0300	Taiwan, VO Free China	5950na	7130as	9680na	11740ca
		15415as	17715as	17750as	17795pa			11825as	15345as		
0200-0300 vl	Australia, VL8A Alice Spg	2310do				0200-0300	United Kingdom, BBC WS	5970sa	5975va	6135af	6175va
0200-0300 vl	Australia, VL8K Katherine	5025do						7235va	9560va	9590va	9605va
0200-0300	Australia, VL8T Tent Crk	4910do						9915sa	11955as	15360as	
0200-0300	Australia, Defense Forces R	13525as				0200-0300	USA, KAIJ Dallas TX	5810am	9815am		
0200-0215	Bangladesh, Radio	4880do	15520do			0200-0300	USA, KTNB Salt Lk City UT	7510am			
0200-0300 vl	Canada, CBC N Quebec Svc	9625do				0200-0300	USA, KVOH Los Angeles CA	9975am			
0200-0300	Canada, CFCX Montreal	6005do				0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	Canada, CFRX Toronto	6070do				0200-0300	USA, Monitor Radio Intl	5850na	9430am		
0200-0300	Canada, CFVP Calgary	6030do				0200-0300	USA, Voice of America	7115as	7205as	7651as	9635as
0200-0300	Canada, CHNX Halifax	6130do						11705as	11725as	15170as	15250as
0200-0300	Canada, CKZN St John's	6160do						17740as	17820as		
0200-0300	Canada, CKZU Vancouver	6160do				0200-0300	USA, WEWN Birmingham AL	5825eu	7425na	11775na	
0200-0259	Canada, R Canada Intl	6120ca	9535ca	9755na	11715am	0200-0300	USA, WGTG McCaysville GA	9400am			
		13670am				0200-0300	USA, WHRI Noblesville IN	5745am	7315am		
0200-0300	Costa Rica, RF Peace Intl	6205am	7385am			0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	Cuba, Radio Havana	6000na	9820na	9830na		0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300	Ecuador, HCJB	9745am	21455va			0200-0300	USA, WWCR Nashville TN	2390am	3230am	5065am	5935am
0200-0300	Egypt, Radio Cairo	9475na				0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0250	Germany, Deutsche Welle	7285as	9640as	9690as	11545as	0200-0300	Vietnam, Voice of	5940na	7250as	9840na	15335na
		11945as	11965as	12045as		0203-0210	Croatia, Croatian Radio	5895eu	7165eu		
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0215-0225	Nepal, Radio	7165do			
0200-0300	Lebanon, Wings of Hope	9960va				0230-0300	Albania, R Tirana Intl	6140na	7160na		
0200-0300 smtwh	Malaysia, Radio	7295do				0230-0259	Austria, R Austria Intl	9655na	9870ca	13730sa	
0200-0300	Netherlands, Radio	5905as	7305as	9860as	11655as	0230-0300	Hungary, Radio Budapest	9870na	11870na		
0200-0300	New Zealand, R NZ Intl	15115pa				0230-0255	Moldova, R Moldova Intl	7520na			
0200-0300 vl	Papua New Guinea, NBC	9675do				0230-0245	Pakistan, Radio	7290as	15120as	15485as	17705as
0200-0300	Romania, R Romania Intl	5990na	6155na	9510na	9570na			17725as	21730as		
		11940na				0230-0300	Philippines, R Pilipinas	17760me	17865me	21580me	
0200-0300	Russia, Voice of Russia WS	7070na	7240na	9620na	12010na	0230-0300 twh	Portugal, R Portugal Intl	6095am	9570am		
		12050na	13645na	13665na	15180na	0230-0300	Sweden, Radio	7290na			
		15580na				0238-0255 1&3rd m	Denmark, R Denmark Intl	7465am	9560am		
0200-0230	Serbia, Radio Yugoslavia	7130eu				0245-0300	India, All India Radio	3945do	6045do	7110do	11830do
0200-0300	Slovakia, Adv World Radio	11610as						15135do			
0200-0300	South Korea, R Korea Intl	7275am	11725am	11810am	15575am	0250-0300	Vatican State, Vatican R	6095na	7305na	9605na	

SELECTED PROGRAMS

Sundays

- 0200 USA, WEWN Birmingham AL: Prayer Quest. Father Thomas Dubay of the Society of Mary talks about contemplation and meditation.
- 0200 Costa Rica, R Peace Intl: World of Radio. Glenn Hauser's essential program for the shortwave listener.
- 0200 USA, KVOH Los Angeles CA: Counsel Talk. Open line radio for those who want to meet problems head on.
- 0200 USA, WRNO, New Orleans LA: New Orleans Jazz Club. A musical geography of New Orleans.
- 0225 Netherlands, Radio: Program Info. See S 0125.
- 0230 Costa Rica, R Peace Intl: RFPI's Mailbag. The latest news and happenings at RFPI and responses to listener letters.
- 0230 USA, WRNO, New Orleans LA: Prophecy Flash. William F. Dankenbring evangelizes from California.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0253 Netherlands, Radio: Weekend. See S 0053.

Mondays

- 0200 Costa Rica, R Peace Intl: UN World Chronicle. A program about United Nations development efforts.
- 0200 USA, WRNO, New Orleans LA: Prophecy Flash. See S 0230.
- 0225 Netherlands, Radio: Program Info. See S 0125.
- 0230 Costa Rica, R Peace Intl: My Green Earth. An environment program for children that explores the world of animals, plants, and cultures.
- 0230 USA, WRNO, New Orleans LA: Scriptures for America. Peter J. Peters exposes the world's evils.
- 0238 Netherlands, Radio: Sincerely Yours. See S 1138.
- 0253 Netherlands, Radio: Sounds Interesting. See S 1153.

Tuesdays

- 0200 USA, KVOH Los Angeles CA: World Changers Radio. Bill Bright and Bob Douglas.
- 0200 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0225 Netherlands, Radio: Program Info. See S 0125.
- 0228 USA, WEWN Birmingham AL: A Homily for Today. Various presenters.
- 0230 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0236 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0240 Costa Rica, R Peace Intl: Earth and Sky. See S 2353.
- 0244 Costa Rica, R Peace Intl: Tropical Conservation Newsbureau

- Report. A report on ecology in the western hemisphere.
- 0253 Netherlands, Radio: Research File. See M 1153.
- 0256 USA, WEWN Birmingham AL: Today's Saints. A short biography of a saint whose feastday is being celebrated.

Wednesdays

- 0200 USA, WEWN Birmingham AL: The Catechism Explained. See M 1400.
- 0200 Costa Rica, R Peace Intl: The Far Right Radio Review. See S 0400.
- 0200 USA, KVOH Los Angeles CA: World Changers Radio. Bill Bright and Bob Douglas.
- 0200 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0225 Netherlands, Radio: Program Info. See S 0125.
- 0228 USA, WEWN Birmingham AL: A Homily for Today. See T 0228.
- 0230 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0236 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0240 Costa Rica, R Peace Intl: Earth and Sky. See S 2353.
- 0245 Costa Rica, R Peace Intl: UN Scope. A news program about the United Nations and its related agencies.
- 0253 Netherlands, Radio: Mirror Images. See T 1153.

Thursdays

- 0200 Costa Rica, R Peace Intl: Second Opinion. See T 0523.
- 0200 USA, KVOH Los Angeles CA: World Changers Radio. Bill Bright and Bob Douglas.
- 0200 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0225 Netherlands, Radio: Program Info. See S 0125.
- 0228 USA, WEWN Birmingham AL: A Homily for Today. See T 0228.
- 0230 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0236 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0254 Radio Netherlands: Documentary (1). Lessons in Revolution (4th). See W 1154.
- 0254 Radio Netherlands: Documentary (2). Preparing for Atlanta — Part 1 (11th). See A 2354.
- 0254 Radio Netherlands: Documentary (3). Preparing for Atlanta — Part 2 (18th). See F 1454.

- 0254 Radio Netherlands: Documentary (4). Living on the Land — Part 1 (25th). See F 2354.
- 0254 Radio Netherlands: Documentary (5). Living on the Land — Part 2 (1 Jul). See H 0054.
- 0256 USA, WEWN Birmingham AL: Today's Saints. See T 0256.

Fridays

- 0200 Costa Rica, R Peace Intl: Living Enrichment Center. See M 0400.
- 0200 USA, KVOH Los Angeles CA: World Changers Radio. Bill Bright and Bob Douglas.
- 0200 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0215 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0225 Netherlands, Radio: Program Info. See S 0125.
- 0228 USA, WEWN Birmingham AL: A Homily for Today. See T 0228.
- 0230 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0236 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0240 Costa Rica, R Peace Intl: Earth and Sky. See S 2353.
- 0245 Costa Rica, R Peace Intl: The Neumaier Report. Poughkeepsie NY columnist, Dr John Neumaier, comments on a wide variety of socially relevant issues.
- 0253 Netherlands, Radio: Media Network. See H 0153.
- 0256 USA, WEWN Birmingham AL: Today's Saints. See T 0256.

Saturdays

- 0200 Costa Rica, R Peace Intl: Making Contact. See S 0330.
- 0200 USA, KVOH Los Angeles CA: World Changers Radio. Bill Bright and Bob Douglas.
- 0200 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0225 Netherlands, Radio: Music Break. See S 0025.
- 0228 USA, WEWN Birmingham AL: A Homily for Today. See T 0228.
- 0230 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0236 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0238 Netherlands, Radio: Newsline. See S 0038.
- 0240 Costa Rica, R Peace Intl: Earth and Sky. See S 2353.
- 0253 Netherlands, Radio: A Good Life. See M 1253.

FREQUENCIES

0300-0400	Australia, Radio	13605pa 15365pa 17795pa	13755pa 15415as	15240pa 15510as	15245as 17750pa	0300-0315 0300-0400 0300-0330	Uganda, Radio Ukraine, R Ukraine Intl United Kingdom, BBC WS	3340do 7150na 5970sa 15360as	4976do 9550na 6135af 7235va 7325sa		
0300-0400 vl	Australia, VL8A Alice Spg	2310do				0300-0400	United Kingdom, BBC WS	3255af 6175va 6190af 6195eu 9410va	3955eu 5975va 6005af 6005af		
0300-0400 vl	Australia, VL8K Katherine	5025do				0300-0400	USA, KAIJ Dallas TX	12095af 5810am 9815am	12095af 5810am 9815am		
0300-0400 vl	Australia, VL8T Tent Crk	4910do				0300-0400	USA, KATN Salt Lk City UT	7510am			
0300-0400 vl	Canada, CBC N Quebec Svc	9625do				0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	Canada, CFCX Montreal	6005do				0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	Canada, CFRX Toronto	6070do				0300-0400	USA, Monitor Radio Intl	5850na	7535af		
0300-0400	Canada, CFVP Calgary	6030do				0300-0400	USA, Voice of America	6035af 6080af 6115af 7105af	6035af 6080af 6115af 7105af		
0300-0400	Canada, CHNX Halifax	6130do				0300-0400	USA, WGTG McCaysville GA	9400am			
0300-0400	Canada, CKZN St John's	6160do				0300-0400	USA, WHRI Noblesville IN	5745am	7315am		
0300-0400	Canada, CKZU Vancouver	6160do				0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	China, China Radio Intl	9690na	9710na	11760na		0300-0400	USA, WRNO New Orleans LA	7395am			
0300-0400 vl	Costa Rica, Faro del Carib	5055do				0300-0400	USA, WWCR Nashville TN	2390am	3230am	5065am	5935am
0300-0400	Costa Rica, RF Peace Intl	6205am	7385am			0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0400	Cuba, Radio Havana	6000na	9820na	9830na		0300-0315	Vatican State, Vatican R	6095na	7305na	9605na	
0300-0327	Czech Rep, Radio Prague	5930na	7345na			0300-0400 vl	Zimbabwe, Zimbabwe BC	3396do			
0300-0400	Ecuador, HCJB	9745am	21455va			0303-0310	Croatia, Croatian Radio	5895eu	7165eu		
0300-0330	Egypt, Radio Cairo	9475na				0315-0330 s	Greece, Voice of	7448na	9420na	9935na	
0300-0350	Germany, Deutsche Welle	6085na 9640na	6185na	9535na	9615na	0320-0350	Vatican State, Vatican R	7360af	9660af		
0300-0400	Guatemala, Radio Cultural	3300do				0330-0357	Czech Rep, Radio Prague	9480as			
0300-0400	Japan, NHK/Radio	11790na	11840as	15230na	17810as	0330-0355	Moldova, R Moldova Intl	7520na			
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0330-0400	Slovakia, Adv World Radio	9465af			
0300-0400	Lebanon, Wings of Hope	9960va				0330-0400 vl	Sweden, Radio	7115na			
0300-0330 vl	Mexico, Radio Mexico Intl	9705na				0330-0400 vl	Tanzania, Radio	5050af			
0300-0325	Netherlands, Radio	5905as	7305as	9860as	11655as	0330-0400	UAE, Radio Dubai	13675na	15395eu	21605na	
0300-0400	New Zealand, R NZ Intl	15115pa				0330-0400	United Kingdom, BBC WS	9610af	11730af	11955as	15280as
0300-0400 vl	Papua New Guinea, NBC	9675do				0335-0355 vl	India, All India Radio	7110do	11830do	15135do	
0300-0330	Philippines, R Pilipinas	17760me	17865me	21580me		0338-0355 1&3rd m	Denmark, R Denmark Intl	7165am	7465am	9565am	
0300-0400	Russia, Voice of Russia WS	7230na 13645na	9620na 13665na	12010na 15180na	12050na 15580na	0340-0350	Greece, Voice of	7448na	9420na	9935na	
0300-0400	S Africa, Channel Africa	3220af	5955af			0345-0400 irreg	Burundi, Radio Nationale	6140do			
0300-0400	Sri Lanka, Sri Lanka BC	15425as				0345-0400	Tajikistan, Tajik Radio	7245as			
0300-0400	Taiwan, VO Free China	5950na 15345as	9680na	11745as	11825as						
0300-0330	Thailand, Radio	15370na									
0300-0400	Turkey, Voice of	9655va	9685eu								

SELECTED PROGRAMS

Sundays

- 0300 Costa Rica, R Peace Intl: CounterSpin. Fairness and Accuracy in Media (FAIR) examines how the media reports key stories.
- 0300 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0300 USA, WRNO, New Orleans LA: The Overcomer Broadcast (live). See S 0000.
- 0304 Czech Rep, Radio Prague: Live in Prague. See S 0004.
- 0308 Ukraine, R Ukraine Intl: Ukrainian Diary. See S 0008.
- 0316 Ukraine, R Ukraine Intl: Hello from Kiev. See S 0016.
- 0330 Costa Rica, R Peace Intl: Making Contact. Fresh perspectives on social and political dynamics in the US and around the world.

Mondays

- 0300 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallion. See S 1330.
- 0300 Costa Rica, R Peace Intl: New Dimensions Radio. Conversations with innovative thinkers whose ideas are on the leading edge of change.
- 0300 USA, KVOH Los Angeles CA: World Changers Radio. Bill Bright and Bob Douglas.
- 0300 USA, WRNO, New Orleans LA: Scriptures for America. See M 0230.
- 0304 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0306 Czech Rep, Radio Prague: The Week and Politics. See S 1236.
- 0308 Ukraine, R Ukraine Intl: Ukrainian Diary. See S 0008.
- 0313 Czech Rep, Radio Prague: From the Weeklies. See S 1243.
- 0319 Czech Rep, Radio Prague: What's Up. See S 1249.
- 0319 Ukraine, R Ukraine Intl: Music from Ukraine. See M 0019.
- 0334 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0336 Czech Rep, Radio Prague: The Week and Politics. See S 1236.
- 0343 Czech Rep, Radio Prague: From the Weeklies. See S 1243.
- 0349 Czech Rep, Radio Prague: What's Up. See S 1249.

Tuesdays

- 0300 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallion. See S 1330.
- 0300 Costa Rica, R Peace Intl: Steppin' Out of Babylon. Sue Supriano interviews people who speak out against injustice

and stand up for freedom and liberty.

- 0300 USA, KVOH Los Angeles CA: Radio Liberty. Stan Monteith with the story behind the story and the news behind the news.
- 0300 USA, WRNO, New Orleans LA: The Overcomer Broadcast (live). See S 0000.
- 0304 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0309 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0320 Ukraine, R Ukraine Intl: Closeup. The most reliable information about life in Ukraine.
- 0330 Costa Rica, R Peace Intl: Voices of Our World. Maryknoll missionary Steve De Mott hosts this social justice magazine program.
- 0334 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0339 Czech Rep, Radio Prague: Press Review. See M 1309.

Wednesdays

- 0300 Costa Rica, R Peace Intl: World of Radio. See S 0200.
- 0300 USA, KVOH Los Angeles CA: Radio Liberty. Stan Monteith with the story behind the story and the news behind the news.
- 0300 USA, WRNO, New Orleans LA: The Overcomer Broadcast (live). See S 0000.
- 0305 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0320 Ukraine, R Ukraine Intl: Closeup. See T 0320.
- 0323 Czech Rep, Radio Prague: What's Up. See S 1249.
- 0330 Costa Rica, R Peace Intl: RFP's Mailbag. See S 0230.
- 0335 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0353 Czech Rep, Radio Prague: What's Up. See S 1249.

Thursdays

- 0300 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallion. See S 1330.
- 0300 Costa Rica, R Peace Intl: This Way Out. A lesbian and gay radio magazine.
- 0300 USA, KVOH Los Angeles CA: Radio Liberty. Stan Monteith with the story behind the story and the news behind the news.
- 0300 USA, WRNO, New Orleans LA: The Overcomer Broadcast (live). See S 0000.
- 0305 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0310 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0313 Czech Rep, Radio Prague: From the Archives. See W 1313.

- 0320 Ukraine, R Ukraine Intl: Closeup. See T 0320.
- 0321 Czech Rep, Radio Prague: The Arts. See W 1321.
- 0330 USA, WEWN Birmingham AL: The Spirituality of the Catholic Church. Fr. Keenan teaches.
- 0330 Costa Rica, R Peace Intl: New Dimensions Radio. See M 0300.
- 0340 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0343 Czech Rep, Radio Prague: From the Archives. See W 1313.
- 0351 Czech Rep, Radio Prague: The Arts. See W 1321.

Fridays

- 0300 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallion. See S 1330.
- 0300 Costa Rica, R Peace Intl: Alternative Radio. See T 0400.
- 0300 USA, KVOH Los Angeles CA: Radio Liberty. Stan Monteith with the story behind the story and the news behind the news.
- 0300 USA, WRNO, New Orleans LA: The Overcomer Broadcast (live). See S 0000.
- 0305 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0309 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0317 Czech Rep, Radio Prague: I'd Like You to Meet. See H 1319.
- 0320 Ukraine, R Ukraine Intl: Closeup. See T 0320.
- 0330 USA, WEWN Birmingham AL: Mercy Our Mission. See W 1630.
- 0335 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0339 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0347 Czech Rep, Radio Prague: I'd Like You to Meet. See H 1319.

Saturdays

- 0300 USA, WEWN Birmingham AL: The Holy Rosary with Father Scallion. See S 1330.
- 0300 Costa Rica, R Peace Intl: New Dimensions Radio. See M 0300.
- 0300 USA, KVOH Los Angeles CA: Radio Liberty. Stan Monteith with the story behind the story and the news behind the news.
- 0300 USA, WRNO, New Orleans LA: The Overcomer Broadcast (live). See S 0000.
- 0306 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0308 Ukraine, R Ukraine Intl: Baroque. See A 0018.
- 0311 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0314 Czech Rep, Radio Prague: Calling All Listeners. See F 1314.
- 0336 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 0341 Czech Rep, Radio Prague: Press Review. See M 1309.
- 0344 Czech Rep, Radio Prague: Calling All Listeners. See F 1314.

FREQUENCIES

0400-0500	Australia, Radio	11880pa	13605as	15240pa	15365pa	0400-0415	Uganda, Radio	3340do	4976do		
		15415pa	17715pa	17750as	17795pa	0400-0500	United Kingdom, BBC WS	3255af	3955eu	5975va	6005af
0400-0500 vl	Australia, VL8A Alice Spg	2310do						6175va	5180eu	6190af	6195eu
0400-0500 vl	Australia, VL8K Katherine	5025do						7160af	9410va	9600af	11760va
0400-0500 vl	Australia, VL8T Tent Crk	4910do						11955as	12095af	15280as	15310as
0400-0500	Bulgaria, Radio	9700na	11720na					15575va			
0400-0500 vl	Canada, CBC N Quebec Svc	9625do				0400-0430	United Kingdom, BBC WS	3955eu	6180eu	9610af	
0400-0500	Canada, CFCX Montreal	6005do				0400-0500	USA, KAIJ Dallas TX	5810am	9815am		
0400-0500	Canada, CFRX Toronto	6070do				0400-0500	USA, KTVN Salt Lk City UT	7510am			
0400-0500	Canada, CFVP Calgary	6030do				0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	Canada, CHNX Halifax	6130do				0400-0500	USA, KWHR Naalehu HI	17510as			
0400-0500	Canada, CKZN St John's	6160do				0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	Canada, CKZU Vancouver	6160do				0400-0500	USA, Voice of America	6035af	6080af	7170va	7280af
0400-0430	Canada, R Canada Intl	11835me	11905me	15275me				7340af	7405af	9575af	9885af
0400-0500	China, China Radio Intl	9730na						11965va	15205va		
0400-0500	Costa Rica, RF Peace Intl	6205am	7385am			0400-0430	USA, Voice of America	6145af	7340af		
0400-0500	Cuba, Radio Havana	6000na	6180na	9820na	9830na	0400-0500	USA, WEWN Birmingham AL	5825eu	7425na		
0400-0500	Ecuador, HCJB	9745am	21455va			0400-0500	USA, WHRI Noblesville IN	5760am	7315am		
0400-0450	Germany, Deutsche Welle	5990af	6015af	6185af	7150af	0400-0500	USA, WJCR Upton KY	7490na	13595na		
		7225af	9565af	11765af		0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500 twtfa	Guatemala, Radio Cultural	3300do				0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0415	Israel, Kol Israel	7465na	9435na	17545au		0400-0500	USA, WWCR Nashville TN	2390am	3230am	5065am	5935am
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0400-0500	USA, WYFR Okeechobee FL	7355eu	9985af		
0400-0500	Lebanon, Wings of Hope	9960va				0400-0445	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0430 vl/m-a	Mexico, Radio Mexico Intl	9705na				0400-0430	Vietnam, Voice of	7360na	9840na	12020na	
0400-0455	Moldova, R Moldova Intl	7520eu				0400-0500	Zambia, Christian Voice	6065af			
0400-0458	New Zealand, R NZ Intl	15115pa				0400-0500 vl	Zimbabwe, Zimbabwe BC	3396do			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as		0403-0410	Croatia, Croatian Radio	5895eu	7165eu		
0400-0430 m	Norway, Radio Norway Intl	7520na				0425-0440	Italy, RAI Intl	5975eu	7275eu		
0400-0500 vl	Papua New Guinea, NBC	9675do				0425-0500	Nigeria, FRCN/Radio	3326do	4990do		
0400-0456	Romania, R Romania Intl	5990na	6155na	7105na	9510na	0430-0500	Australia, Radio	15510pa			
		9570na	9625na	11940na		0430-0500	Australia, Defense Forces R	13525as			
0400-0500	Russia, Voice of Russia WS	7230na	9620na	12010na	12050na	0430-0500	Netherlands, Radio	6165na	9550na		
		13645na	13665na	15180na	15580na	0430-0500	Serbia, Radio Yugoslavia	7130na	9580na	11870na	
0400-0455	S Africa, Channel Africa	3220af	5955af			0430-0500	Swaziland, Trans World R	3200af	4775af	6070af	
0400-0427	S Africa, Trans World R	7165af				0430-0500	Switzerland, Swiss R Intl	9905na			
0400-0430	Slovakia, Adv World Radio	11600af				0430-0500	United Kingdom, BBC WS	7150eu	15420af		
0400-0430	Sri Lanka, Sri Lanka BC	15425as				0438-0455 1&3rd m	Denmark, R Denmark Intl	7520va	9565va	13805va	
0400-0430	Switzerland, Swiss R Intl	6135na	9885na	9905na		0455-0500	Liberia, Radio ELWA	4760do			
0400-0430	Tanzania, Radio	5050af				0459-0500 mtwhf	New Zealand, R NZ Intl	9570pa			

SELECTED PROGRAMS

Sundays

- 0400 Costa Rica, R Peace Intl: The Far Right Radio Review. The program that analyzes the growing phenomenon of far right/hate programming on radio.
- 0400 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0405 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0415 Switzerland, Swiss R Intl: Capital Letters (2/4). See S 0115.
- 0415 Switzerland, Swiss R Intl: The Name Game (1/3/5). See S 0115.
- 0430 Costa Rica, R Peace Intl: RFPI Reports. Daily news program of Latin American and Caribbean topics not generally heard in the mainstream media.
- 0430 Swaziland, Trans World Ra: Program News. A preview of coming programs.
- 0430 Switzerland, Swiss R Intl: Network Switzerland. The top Swiss stories and what's happening around the country.
- 0435 Swaziland, Trans World Ra: Music. No information available.
- 0440 Netherlands, Radio: Newsline. See S 0038.
- 0445 Swaziland, Trans World Ra: Way to Life Hour. Dick Saunders explores the Bible.
- 0454 Netherlands, Radio: Weekend. See S 0053.

Mondays

- 0400 Costa Rica, R Peace Intl: Living Enrichment Center. Mary Mannin Morrissey lectures on practical suggestions for everyday living.
- 0400 USA, WRNO, New Orleans LA: Herald of Truth. See S 0130.
- 0405 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0430 Costa Rica, R Peace Intl: RFPI Reports. See S 0430.
- 0430 Swaziland, Trans World Ra: Bible College. See S 0435.
- 0430 Switzerland, Swiss R Intl: Network Switzerland. See S 0430.
- 0437 Netherlands, Radio: Sincerely Yours. See S 1138.
- 0445 Switzerland, Swiss R Intl: Capital Letters (2/4). See S 0115.
- 0453 Netherlands, Radio: Sounds Interesting. See S 1153.

Tuesdays

- 0400 Costa Rica, R Peace Intl: Alternative Radio. Featured speakers critique on multiculturalism, environment, racism, US foreign policy, media, and indigenous rights.
- 0400 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.

- 0400 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0405 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0430 Swaziland, Trans World Ra: Program News. See S 0430.
- 0430 Switzerland, Swiss R Intl: Network Switzerland. See S 0430.
- 0435 Swaziland, Trans World Ra: Our Daily Bread. A daily devotional program from Radio Bible Class.
- 0440 Netherlands, Radio: Newsline. See S 0038.
- 0445 Swaziland, Trans World Ra: Your Tomorrow. See S 0435.
- 0453 Netherlands, Radio: Research File. See M 1153.

Wednesdays

- 0400 Costa Rica, R Peace Intl: UN World Chronicle. See M 0200.
- 0400 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0400 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0405 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0430 Costa Rica, R Peace Intl: My Green Earth. See M 0230.
- 0430 Swaziland, Trans World Ra: Program News. See S 0430.
- 0430 Switzerland, Swiss R Intl: Network Switzerland. See S 0430.
- 0435 Swaziland, Trans World Ra: Our Daily Bread. See T 0435.
- 0440 Netherlands, Radio: Newsline. See S 0038.
- 0445 Swaziland, Trans World Ra: Happy Side. See S 0435.
- 0453 Netherlands, Radio: Mirror Images. See T 1153.

Thursdays

- 0400 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0400 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0405 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0430 Costa Rica, R Peace Intl: Voices of Our World. See T 0330.
- 0430 Swaziland, Trans World Ra: Program News. See S 0430.
- 0430 Switzerland, Swiss R Intl: Network Switzerland. See S 0430.
- 0435 Swaziland, Trans World Ra: Our Daily Bread. See T 0435.
- 0440 Netherlands, Radio: Newsline. See S 0038.
- 0445 Swaziland, Trans World Ra: The Storyteller. See S 0435.
- 0454 Radio Netherlands: Documentary (1). Lessons in Revolution (4th). See W 1154.
- 0454 Radio Netherlands: Documentary (2). Preparing for Atlanta — Part 1 (11th). See A 2354.

- 0454 Radio Netherlands: Documentary (3). Preparing for Atlanta — Part 2 (18th). See F 1454.
- 0454 Radio Netherlands: Documentary (4). Living on the Land — Part 1 (25th). See F 2354.
- 0454 Radio Netherlands: Documentary (5). Living on the Land — Part 2 (1 Jul). See H 0054.

Fridays

- 0400 Costa Rica, R Peace Intl: Micro-Power Radio in the U.S.. See T 0530.
- 0400 Costa Rica, R Peace Intl: The Food Not Bombs Radio Network (monthly). See T 0530.
- 0400 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0400 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0405 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0430 Costa Rica, R Peace Intl: WINGS. See W 0530.
- 0430 Swaziland, Trans World Ra: Program News. See S 0430.
- 0430 Switzerland, Swiss R Intl: Network Switzerland. See S 0430.
- 0435 Swaziland, Trans World Ra: Our Daily Bread. See T 0435.
- 0440 Netherlands, Radio: Newsline. See S 0038.
- 0445 Swaziland, Trans World Ra: Hope for Today. See S 0435.
- 0453 Netherlands, Radio: Media Network. See H 0153.

Saturdays

- 0400 Costa Rica, R Peace Intl: World of Radio. See S 0200.
- 0400 Radio Mexico Intl: The World of Mexican Art. See S 1500.
- 0400 USA, KVOH Los Angeles CA: Music of Hope. Recordings of contemporary christian music.
- 0400 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0405 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 0430 Costa Rica, R Peace Intl: RFPI's Mailbag. See S 0230.
- 0430 Swaziland, Trans World Ra: Program News. See S 0430.
- 0430 Switzerland, Swiss R Intl: Swiss Scene. People and politics.
- 0435 Swaziland, Trans World Ra: Children's Music. See S 0435.
- 0440 Netherlands, Radio: Newsline. See S 0038.
- 0445 Swaziland, Trans World Ra: Storybook Room. See S 0435.
- 0453 Netherlands, Radio: A Good Life. See M 1253.

FREQUENCIES

0500-0600	Australia, Radio	11880pa	13605as	15240pa	15245as	0500-0600	United Kingdom, BBC WS	3255af	3955eu	5975va	6005af
0500-0600 vl	Australia, VL8A Alice Spg	15365pa	15415as	17715pa	17795pa	0500-0600	USA, KAIJ Dallas TX	6175va	6180eu	6190af	6195eu
0500-0600 vl	Australia, VL8K Katherine	2310do				0500-0600	USA, KTVN Salt Lk City UT	7150eu	7160af	9410va	9600af
0500-0600 vl	Australia, VL8T Tent Crk	5025do				0500-0600	USA, KVOH Los Angeles CA	9640va	9740as	11760va	11955as
0500-0600	Australia, Defense Forces R	4910do				0500-0600	USA, KWHR Naalehu HI	15280as	15310as	15360va	15420af
0500-0600	Canada, CFCX Montreal	13525as				0500-0600	15575va	17640af	17885af		
0500-0600	Canada, CFRX Toronto	6005do				0500-0600	USA, WHRI Noblesville IN	5810am	9815am		
0500-0600	Canada, CFVP Calgary	6070do				0500-0600	USA, WJCR Upton KY	7510am			
0500-0600	Canada, CHNX Halifax	6030do				0500-0600 mtwhfa	USA, WMLK Bethel PA	9975am			
0500-0600	Canada, CKZU Vancouver	6130do				0500-0600	USA, WRNO New Orleans LA	9930as			
0500-0529 mtwhfa	Canada, R Canada Intl	6160do				0500-0600	USA, WWCR Nashville TN	7535eu			
0500-0600	China, China Radio Intl	6050eu	7295va	15430af	17840va	0500-0600	USA, WYFR Okeechobee FL	6035af	6080af	7170va	7295af
0500-0600	Costa Rica, Adv World R	9560na				0500-0600	Vatican State, Vatican R	9775af	9885af	11965va	15205va
0500-0600	Costa Rica, RF Peace Intl	5030ca	6150ca	9725ca		0500-0600	Vietnam, Voice of	5760am	7315am		
0500-0600	Cuba, Radio Havana	6205am	7385am			0500-0600	Zambia, Christian Voice	7490na	13595na		
0500-0600	Ecuador, HCJB	9505na	9830na			0500-0600 vl	Zimbabwe, Zimbabwe BC	9465eu			
0500-0550	Germany, Deutsche Welle	9745am	21455va			0503-0510	Croatia, Croatian Radio	7395am			
0500-0600 vl	Italy, IRRS	5960na	6045na	6185na	9515na	0505-0600	Swaziland, Trans World R	2390am	3230am	5065am	5935am
0500-0600	Japan, NHK/Radio	6110na	7230eu	11725as	11740as	0515-0530	Switzerland, Swiss R Intl	5985na	7355eu	9985eu	11580af
0500-0530	Japan, NHK/Radio	11920na	17810as			0525-0600	Ghana, Ghana Broadc Corp	9660af	11625af	15570af	
0500-0600 vl	Kenya, Kenya Broadc Corp	11885na	11895na	15230na		0530-0559	Austria, R Austria Intl	5880eu	7250eu		
0500-0600	Lebanon, Wings of Hope	4885do	4935do	6150do		0530-0600	Georgia, Radio	7360na	9840na	12030na	
0500-0600	Liberia, Radio ELWA	9960va				0530-0600	Kazakhstan, R Alma Ata	6065af			
0500-0510 mtwhf	Malawi, MBC	4760do				0530-0556	Romania, R Romania Intl	3396do			
0500-0525	Netherlands, Radio	3380do				0530-0600 vl	Slovakia, Adv World Radio	5895eu	7165eu		
0500-0600	New Zealand, R NZ Intl	6165na	9550na			0538-0555 1&3rd m	Denmark, R Denmark Intl	3200af	5055af	9500af	
0500-0505	Nigeria, FRCN/Radio	9570pa				0555-0600	Malaysia, Voice of	6165eu	9535eu		
0500-0600 vl	Papua New Guinea, NBC	3326do	4990do					3366do	4915do		
0500-0600	Russia, Voice of Russia WS	9675do						6015na			
0500-0555	S Africa, Channel Africa	12010na	12040na	12050na	13645na			11910eu			
0500-0600	Slovakia, Adv World Radio	13665na	15580na					11705eu			
0500-0556	Spain, R Exterior Espana	5955af	9590af					11810af	11940af	15270af	15340af
0500-0600	Swaziland, Trans World R	7215eu						17790as	17790af		
		9540na						11600eu			
		6070af						5975do			

SELECTED PROGRAMS

Sundays

- 0500 Costa Rica, AWR Alajuela: Your Story Hour. Dramatized children's stories.
- 0500 USA, KVOH Los Angeles CA: Strength for the Day. A time of meditation.
- 0530 Costa Rica, AWR Alajuela: Voice of Prophecy. Write for an adult bible study program.
- 0530 Swaziland, Trans World Ra: Radio Bible Class. Bible teaching and the Men of Praise providing the music.

Mondays

- 0500 Costa Rica, AWR Alajuela: The Quiet Hour. The Tucker Family provides music and inspiration for both young and old listeners.
- 0500 Costa Rica, R Peace Intl: Peace Forum (biweekly). A grab bag of individual programs and special short series received by RFPI.
- 0500 Costa Rica, R Peace Intl: World Goodwill Forum (biweekly). Lectures on the needs of humanity.
- 0500 USA, KVOH Los Angeles CA: Strength for the Day. A time of meditation.
- 0530 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
- 0530 Swaziland, Trans World Ra: Back to the Bible. A mix of music and daily Bible study.

Tuesdays

- 0500 Costa Rica, R Peace Intl: UN Caribbean Echo. Produced for the Caribbean with news about United Nations activities in the area and internationally.
- 0500 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0500 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 0500 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0505 Costa Rica, AWR Alajuela: Focus on God's Love. Music and an inspirational message by Ted Duncan.
- 0506 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 0517 Costa Rica, R Peace Intl: Earth and Sky. See S 2353.
- 0520 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
- 0520 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0523 Costa Rica, R Peace Intl: Second Opinion. Matthew Rothschild, editor of "the Progressive", talks to a wide variety of guests.
- 0525 Costa Rica, R Peace Intl: Earthwatch Radio. A short feature that explores an environmental topic.
- 0530 Costa Rica, R Peace Intl: Micro-Power Radio in the U.S. The best programming of citizen-owned radio stations in the US.

- 0530 Costa Rica, R Peace Intl: The Food Not Bombs Radio Network (monthly). North America's homeless problems and government oppression at home and abroad.
- 0530 Swaziland, Trans World Ra: Back to the Bible. See M 0530.
- 0545 Costa Rica, AWR Alajuela: Heart Song. Music to waken your day.
- 0549 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 0552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Wednesdays

- 0500 Costa Rica, R Peace Intl: UNESCO. A feature program of the United Nations focusing on world educational, scientific, or cultural matters.
- 0500 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0500 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 0500 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0505 Costa Rica, AWR Alajuela: Focus on God's Love. See T 0505.
- 0506 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 0515 Costa Rica, R Peace Intl: UN Daily News. See M 2345.
- 0520 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
- 0523 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0530 Costa Rica, R Peace Intl: WINGS. Women's news and current affairs by the Women's International News Gathering Service.
- 0530 Swaziland, Trans World Ra: Back to the Bible. See M 0530.
- 0545 Costa Rica, AWR Alajuela: Heart Song. See T 0545.
- 0549 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 0552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Thursdays

- 0500 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0500 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 0500 USA, WRNO, New Orleans LA: The Overcomer Broadcast (live). See S 0000.
- 0505 Costa Rica, AWR Alajuela: Focus on God's Love. See T 0505.
- 0506 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 0515 Costa Rica, R Peace Intl: UN Daily News. See M 2345.
- 0520 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
- 0525 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0530 Costa Rica, R Peace Intl: Vietnam Veterans Radio Network.

- See S 0630.
- 0530 Swaziland, Trans World Ra: Back to the Bible. See M 0530.
- 0545 Costa Rica, AWR Alajuela: Heart Song. See T 0545.
- 0549 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 0552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Fridays

- 0500 Costa Rica, R Peace Intl: Tropical Conservation Newsbureau Report. See T 0244.
- 0500 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0500 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 0500 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0505 Costa Rica, AWR Alajuela: Focus on God's Love. See T 0505.
- 0506 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 0515 Costa Rica, R Peace Intl: UN Daily News. See M 2345.
- 0520 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
- 0525 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0530 Swaziland, Trans World Ra: Back to the Bible. See M 0530.
- 0545 Costa Rica, AWR Alajuela: Heart Song. See T 0545.
- 0549 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 0552 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Saturdays

- 0500 Costa Rica, R Peace Intl: UN Perspective. See T 2330.
- 0500 USA, KVOH Los Angeles CA: The Bible. Reading of the new international version of the holy book.
- 0500 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 0505 Costa Rica, AWR Alajuela: Focus on God's Love. See T 0505.
- 0520 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
- 0520 Costa Rica, R Peace Intl: UN Daily News. See M 2345.
- 0525 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
- 0530 Costa Rica, R Peace Intl: Second Opinion. See T 0523.
- 0530 Swaziland, Trans World Ra: Young Life. See S 0435.
- 0545 Costa Rica, AWR Alajuela: Heart Song. See T 0545.
- 0545 Swaziland, Trans World Ra: Visit with Mrs. G. Bible stories for children.

FREQUENCIES

0600-0700	Australia, Radio	9860pa 15240pa 15530as	11880pa 15365pa 17715as	12080pa 15415as 17880as	13605as 15510as	0600-0700 0600-0630 0600-0700	Switzerland, Swiss R Intl Swaziland, Trans World R United Kingdom, BBC WS	9885af 11730af 3955eu 6195eu 9600af 11780eu 15070va 15420af 17885af	11860af 5975va 6005af 7145pa 9640va 11940af 15280as 15310as 17640af	13635af 6005af 7160af 9740as 11955as 15310as 17790as	5935am 6175va 9410va 11760va 12095va 15360va 17790as
0600-0700 vl	Australia, VL8A Alice Spg	2310do				0600-0700	USA, KAIJ Dallas TX	5810am	9815am		
0600-0700 vl	Australia, VL8K Katherine	5025do				0600-0700	USA, KTNB Salt Lk City UT	7510am			
0600-0700 vl	Australia, VL8T Tent Crk	4910do				0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0630	Australia, Defense Forces R	13525as				0600-0700	USA, KWHR Naalehu HI	17780as			
0600-0700 vl	Canada, CBC N Quebec Svc	9625do				0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	Canada, CFCX Montreal	6005do				0600-0700	USA, Voice of America	6035af 9630af 12080af	6140va 11805va 15205va	7170va 11950af	7285af 11965va
0600-0700	Canada, CFRX Toronto	6070do				0600-0630	USA, Voice of America	6080af	9435af		
0600-0700	Canada, CFVP Calgary	6030do				0600-0700	USA, WEWN Birmingham AL	5825eu	7425na		
0600-0700	Canada, CHNX Halifax	6130do				0600-0700	USA, WHRI Noblesville IN	5760am	7315am		
0600-0700	Canada, CKZU Vancouver	6160do				0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700	Costa Rica, RF Peace Intl	6205am	7385am			0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	Cuba, Radio Havana	9505na	9830na			0600-0700	USA, WVCR Nashville TN	2390am	3230am	5065am	5935am
0600-0700	Ecuador, HCJB	9745am	21455am			0600-0700	USA, WYFR Okeechobee FL	5985eu	7355eu	9985af	
0600-0650	Germany, Deutsche Welle	11915af 17875af	13790af	15185af 15225af		0600-0645 mtwhf	Vatican State, Vatican R	4005eu 15215me	5880eu	7250eu	9645eu
0600-0615	Ghana, Ghana Broadc Corp	3316do	4915do			0600-0700	Yemen, Yemeni Rep Radio	9780as			
0600-0700 vl	Italy, IRRS	3985va				0600-0700	Zambia, Christian Voice	6065af			
0600-0700	Japan, NHK/Radio	11725as	11850au	17810as		0600-0700 vl	Zimbabwe, Zimbabwe BC	5975do			
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		0603-0610	Croatia, Croatian Radio	5920eu	7165eu	9830eu	13830eu
0600-0700 vl	Kiribati, Radio	9825do				0605-0700	Swaziland, Trans World R	5055af	6070af	9500af	9650af
0600-0700	Lebanon, Wings of Hope	9960va				0615-0630	Switzerland, Swiss R Intl	6165eu	9535eu		
0600-0700 mtwhf	Liberia, Radio ELWA	4760do				0630-0655	Austria, R Austria Intl	6015na			
0600-0700	Malaysia, Voice of	6175as	9750as	15295au		0630-0700	Belgium, R Vlaanderen Int	5985eu	9925au		
0600-0700	New Zealand, R NZ Intl	9570pa				0630-0700 as	USA, Voice of America	6080af			
0600-0630	Nigeria, FRCN/Radio	3326do	4990do			0630-0700	Vatican State, Vatican R	11625af	13765af	15570af	
0600-0700	North Korea, R Pyongyang	15180as	15230as			0638-0655 1&3rd m	Denmark, R Denmark Intl	7180va	7295va	9590va	13805va
0600-0630 s	Norway, Radio Norway Intl	7180au	7295af	9590au		0645-0655 as	Monaco, Trans World Radio	7115eu			
0600-0700 vl	Papua New Guinea, NBC	9675do				0645-0700	Romania, R Romania Intl	11740pa	11840pa	15250pa	15270pa
0600-0640 vl	Romania, R Romania Intl	9550eu	9665eu	11815eu				17720pa	17805pa		
0600-0700	Russia, Voice of Russia WS	12010na 13665na 15560va	12040na 15470as 15580na	12050na 15490va 17665va	13645na 15490va	0655-0655 mtwhf	Monaco, Trans World Radio	7115eu			
0600-0700	S Africa, Trans World R	11730af									
0600-0610	Sierra Leone, SLBS	3316do									
0600-0630	Slovakia, Adv World Radio	13715af									
0600-0700	Slovakia, Adv World Radio	5905am									
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do								

SELECTED PROGRAMS

Sundays

- 0600 Swaziland, Trans World Ra: Kerygma. See S 0435.
 0605 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 0630 Costa Rica, R Peace Intl: Vietnam Veterans Radio Network. Bringing to light the real stories behind the Vietnam War.
 0640 Monaco, Trans World Radio: Evidence.
 0645 Monaco, Trans World Radio: Christian Brotherhood Hour.

Mondays

- 0600 Costa Rica, R Peace Intl: The Far Right Radio Review. See S 0400.
 0600 Swaziland, Trans World Ra: Family Bible Hour. Ron Hughes tells how to apply Bible principles to daily life.
 0605 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 0630 Costa Rica, R Peace Intl: Peace Forum. See M 0500.
 0640 Monaco, Trans World Radio: Arise!
 0645 Monaco, Trans World Radio: Bible Focus.

Tuesdays

- 0600 Costa Rica, R Peace Intl: RFPI Reports. See S 0430.
 0600 Swaziland, Trans World Ra: Gospel Tide Hour. See S 0435.
 0600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
 0605 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 0606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
 0630 Costa Rica, R Peace Intl: New Dimensions Radio. See M 0300.
 0640 Monaco, Trans World Radio: Arise!
 0645 Monaco, Trans World Radio: Bible Focus.
 0649 USA, Monitor Radio Intl: Letterbox. See M 1249.
 0652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Wednesdays

- 0600 Costa Rica, R Peace Intl: RFPI Reports. See S 0430.
 0600 Swaziland, Trans World Ra: Bringing Christ to the Nations. See S 0435.
 0600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.

- 0605 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 0606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
 0630 Costa Rica, R Peace Intl: University of the Air. See T 2300.
 0640 Monaco, Trans World Radio: Arise!
 0645 Monaco, Trans World Radio: Bible Focus.
 0649 USA, Monitor Radio Intl: Letterbox. See M 1249.
 0652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Thursdays

- 0600 Costa Rica, R Peace Intl: RFPI Reports. See S 0430.
 0600 Swaziland, Trans World Ra: The Haven of Rest. Evangelizing and The Haven Quartet.
 0600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
 0605 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 0606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
 0630 Costa Rica, R Peace Intl: University of the Air. See T 2300.
 0640 Monaco, Trans World Radio: Arise!
 0645 Monaco, Trans World Radio: Bible Focus.
 0649 USA, Monitor Radio Intl: Letterbox. See M 1249.
 0652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Fridays

- 0600 Swaziland, Trans World Ra: The Wesleyan Hour. See S 0435.
 0600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
 0605 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 0606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
 0630 Costa Rica, R Peace Intl: University of the Air. See T 2300.
 0640 Monaco, Trans World Radio: Arise!
 0645 Monaco, Trans World Radio: Bible Focus.
 0649 USA, Monitor Radio Intl: Letterbox. See M 1249.
 0652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Saturdays

- 0600 Costa Rica, R Peace Intl: Voices of Our World. See T 0330.
 0600 Swaziland, Trans World Ra: We Kids. A fast-moving program for children.
 0605 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 0615 Switzerland, Swiss R Intl: Capital Letters (2/4). See S 0115.
 0615 Switzerland, Swiss R Intl: The Name Game (1/3/5). See S 0115.
 0630 Costa Rica, R Peace Intl: University of the Air. See T 2300.
 0640 Monaco, Trans World Radio: Arise!
 0645 Monaco, Trans World Radio: Family Bible Hour.

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FREQUENCIES

0700-0800	Australia, Radio	5995pa 9710pa 17715pa	6020pa 9860pa	6080pa 15415as 15530as					
0700-0730	Australia, Radio	11880as	13605as	15245as	15365pa				
0700-0800 vl	Australia, VL8A Alice Spg	4835do							
0700-0800 vl	Australia, VL8K Katherine	5025do							
0700-0800 vl	Australia, VL8T Tent Crk	4910do							
0700-0800	Canada, CFCX Montreal	6005do							
0700-0800	Canada, CFRX Toronto	6070do							
0700-0800	Canada, CFVP Calgary	6030do							
0700-0800	Canada, CHNX Halifax	6130do							
0700-0800	Canada, CKZU Vancouver	6160do							
0700-0800	Costa Rica, RF Peace Intl	7385am							
0700-0730 m	Costa Rica, RF Peace Intl	6205am							
0700-0727	Czech Rep, Radio Prague	7345eu	9530eu						
0700-0800	Ecuador, HCJB	5900pa	11615eu	21455au					
0700-0800 as	Eqt Guinea, R East Africa	15186af							
0700-0800 mtwhf	Eqt Guinea, Radio Africa	15186af							
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do						
0700-0730 vl	Italy, IRRS	3985va							
0700-0800	Japan, NHK/Radio	7230eu 11920as 21610as	11725as 15165me	11740as 17810va	11850pa 17815af				
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do					
0700-0800 vl	Kiribati, Radio	9825do							
0700-0800	Lebanon, Wings of Hope	9960va							
0700-0800 asmtwh	Malaysia, Radio	7295do							
0700-0800	Malaysia, Voice of	9750as	15295au						
0700-0710	Malaysia, Voice of	6175as							
0700-0800	Monaco, Trans World Radio	7115eu							
0700-0715 mtwhf	New Zealand, R NZ Intl	9570pa							
0700-0758 as	New Zealand, R NZ Intl	9570pa							
0700-0750	North Korea, R Pyongyang	15340af	17765me						
0700-0800 vl	Palau, KHBV/Voice of Hope	9965as							
0700-0745	Romania, R Romania Intl	11740pa 17720pa	11840pa	15250pa	15270pa				
0700-0800	Russia, Voice of Russia WS	15470as	15560va	17570va	17665as				
0700-0710	Sierra Leone, SLBS	3316do							
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do						
0700-0800	Taiwan, VO Free China	5950na							
0700-0800	United Kingdom, BBC WS	3955eu 6195eu 9600af 11940af 15280as 15575me 17885af	7145va 7325eu 9410eu 11760as 15070va 17830af	6175va 6190af					
0700-0730	United Kingdom, BBC WS	6180eu	11780eu						
0700-0715	United Kingdom, BBC WS	6005af	7160af						
0700-0800	USA, KAIJ Dallas TX	5810am	9815am						
0700-0800	USA, KTNB Salt Lk City UT	7510am							
0700-0800	USA, KVOH Los Angeles CA	9975am							
0700-0800	USA, KWHR Naalehu HI	9930as							
0700-0800	USA, Monitor Radio Intl	7535eu							
0700-0800	USA, WEWN Birmingham AL	5825eu	7425na						
0700-0800	USA, WHRI Noblesville IN	5760am	7315am						
0700-0800	USA, WJCR Upton KY	7490na	13595na						
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu							
0700-0800	USA, WWCR Nashville TN	2390am	3230am	5065am	5935am				
0700-0745	USA, WYFR Okeechobee FL	7355eu	9985eu						
0700-0800	USA, WYFR Okeechobee FL	13695af							
0700-0800	Zambia, Christian Voice	6065af							
0700-0800 vl	Zimbabwe, Zimbabwe BC	5975do							
0703-0710 mtwhf	Croatia, Croatian Radio	5920eu	7165eu	9830eu	13830eu				
0705-0800	Swaziland, Trans World R	5055af	9500af	9650af					
0710-0800 vl	Papua New Guinea, NBC	4890do							
0716-0800 mtwhf	New Zealand, R NZ Intl	6100pa							
0730-0755	Austria, R Austria Intl	6155eu	13730eu	15410me	17870me				
0730-0800	Georgia, Radio	11910eu							
0730-0745 s	Greece, Voice of	7450eu	9425eu	11645au					
0730-0735	India, All India Radio	15185do	15260do						
0730-0800 vl	Italy, IRRS	7125va							
0730-0800	Netherlands, Radio	9700pa	9720au	11895pa					
0738-0755 1&3rd m	Denmark, R Denmark Intl	7180va	7295va	9590va	13805va				
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do						
0745-0755	Greece, Voice of	7450eu	9425eu	11645au					
0755-0800	Guam, AWR/KTWR	15200as							
0758-0800 as	New Zealand, R NZ Intl	6100pa							
0800-0900 vl	Australia, VL8A Alice Spg	2310do							
0800-0830 vl	Australia, VL8K Katherine	5025do							
0800-0900 vl	Australia, VL8T Tent Crk	4910do							
0800-0900	Australia, Defense Forces R	15607af	18194af						
0800-0900 vl	Canada, CBC N Quebec Svc	9625do							
0800-0900	Canada, CFCX Montreal	6005do							
0800-0900	Canada, CFRX Toronto	6070do							
0800-0900	Canada, CFVP Calgary	6030do							
0800-0900	Canada, CHNX Halifax	6130do							
0800-0900	Canada, CKZU Vancouver	6160do							
0800-0830	Chile, Radio Esperanza	6090sa							
0800-0900	China, China Radio Intl	11755pa	15440pa	17690pa					
0800-0900	Costa Rica, RF Peace Intl	6205am	7385am						
0800-0830	Ecuador, HCJB	11615eu							
0800-0900	Ecuador, HCJB	5900pa	21455au						
0800-0900 as	Eqt Guinea, R East Africa	15186af							
0800-0900 mtwhf	Eqt Guinea, Radio Africa	15186af							
0800-0805 s	Ghana, Ghana Broadc Corp	3366do							
0800-0900	Guam, TWR/KTWR	15200as							
0800-0900	Indonesia, Voice of	9525as							
0800-0900 vl	Italy, IRRS	7125va							
0800-0900 mtwhf	Italy, IRRS	3985va							
0800-0900 vl	Kiribati, Radio	9825do							
0800-0900	Lebanon, Wings of Hope	9960va							
0800-0900	Malaysia, Radio	7295do							
0800-0825	Malaysia, Voice of	6175as	9750as	15295au					
0800-0820 mtwhf	Monaco, Trans World Radio	7115eu							
0800-0805 a	Monaco, Trans World Radio	7115eu							
0800-0825	Netherlands, Radio	9700pa	9720au	11895pa					
0800-0900	New Zealand, R NZ Intl	6100pa							
0800-0850	North Korea, R Pyongyang	15180as	15230as						
0800-0830 s	Norway, Radio Norway Intl	17860au							
0800-0850	Pakistan, Radio	15470eu	17900eu						
0800-0900 vl	Palau, KHBV/Voice of Hope	9730as	9955as	9965as	15140as				
0800-0900 vl	Papua New Guinea, NBC	4890do							
0800-0900	Russia, Voice of Russia WS	9835va 15560va 15580as	11800va 12025as	15470as					
0800-0810	Sierra Leone, SLBS	3316do							
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do						
0800-0900	South Korea, R Korea Intl	7550eu	13670eu						
0800-0900	United Kingdom, BBC WS	6190af 9740as 11955as 15400va 17830af	6195va 9805va 15207af 15575me 17885af	9410eu 11760as 15280as 17640va 17790as	9600af 11940af 15310as 17790as				
0800-0815	United Kingdom, BBC WS	3955eu	7145va	12095eu					
0800-0900	USA, KAIJ Dallas TX	5810am							
0800-0900	USA, KNLS Anchor Point AK	9615as							
0800-0900	USA, KTNB Salt Lk City UT	7510am							
0800-0900	USA, KWHR Naalehu HI	9930as							
0800-0900	USA, Monitor Radio Intl	7535eu	9430pa	15665eu					
0800-0900	USA, WEWN Birmingham AL	5825eu	7425na						
0800-0900	USA, WHRI Noblesville IN	5760am	7315am						
0800-0900	USA, WJCR Upton KY	7490na	13595na						
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu							
0800-0900	USA, WWCR Nashville TN	2390am	3230am	5065am	5935am				
0800-0900 vl	Zambia, Christian Voice	6065af							
0800-0900 vl	Zimbabwe, Zimbabwe BC	5975do							
0803-0810 as	Croatia, Croatian Radio	5920eu	7165eu	9830eu	13830eu				
0805-0835 mtwhf	Swaziland, Trans World R	4775af							
0815-0900 mtvtf	Nigeria, FRCN/Radio	3326do							
0830-0900 s	Armenia, Voice of	15270eu							
0830-0900 vl	Australia, VL8K Katherine	2485do							
0830-0900	Georgia, Radio	11910me							
0830-0840	India, All India Radio	7250do	15185do	15260do					
0830-0900	Netherlands, Radio	9720au	13700pa						
0830-0900	Slovakia, R Slovakia Intl	11990au	15460au	17550au					
0838-0855 1&3rd m	Denmark, R Denmark Intl	15220va	17860va						
0855-0900	Guam, TWR/KTWR	11830pa							

THANK YOU ...

Additional contributors to this month's Shortwave Guide:

Donald N. Aspinall, Toano, VA; John Babbis, Silver Spring, MD; Brian Bagwell, St. Louis, MO (via e-mail); Capt. Ken Barry, Blackpool, England; C. Clifford Coffman, Hammond, IN; Paul R. Donegan, Glendale, CA; Bob Fraser, Cohasset, MA; Kevin Hecht, Devon, PA; Frank Hillton, Charleston, SC (via e-mail); George Knight, Garfield, NJ; Evan John Konjicija, San Bruno, CA; Gregory Majewski, (via e-mail) Jim Moats, Ravenna, OH; ; Giovanni Serra, Rome, Italy (via e-mail); Robert E. Thomas II, Bridgeport, CT; Roger Tidy, London, England; Larry Van Horn, Brasstown, NC (via e-mail); Jerry Witham, Keaau, HI; BBCMS; BBC World Media; BBC Summary of World Broadcasts; DX Ontario, Fine Timing; NASWA Journal; Internet Shortwave Newsgroups.

0800 UTC

0800-0900	Australia, Radio	5995pa 9710pa 21725as	6020pa 9860pa	6080pa 15530as	9580pa 17715pa
0800-0900 vl	Australia, VL8A Alice Spg	2310do			
0800-0830 vl	Australia, VL8K Katherine	5025do			

FREQUENCIES

0900-1000	Australia, Radio	5995as	7240as	9510as	9580pa	1000-1100	Lebanon, Voice of Hope	6280va			
0900-1000 vl	Australia, VL8A Alice Spg	9860pa	13605as	21725as		1000-1100	Lebanon, Wings of Hope	9960va			
0900-1000 vl	Australia, VL8K Katherine	2310do				1000-1100	Liberia, Radio ELWA	4760do			
0900-1000 vl	Australia, VL8T Tent Crk	2485do				1000-1100	Malaysia, Radio	7295do			
0900-1000	Australia, Defense Forces R	4910do				1000-1100 vl	Malaysia, RTM Kuching	7160do			
0900-0930 mtwhfa	Belgium, R Vlaanderen Int	15607af	18194af	17595af		1000-1100 vl	Malaysia, RTM Kota Kinabalu	5980do			
0900-1000	Canada, CFCX Montreal	6035eu	15545af			1000-1025	Netherlands, Radio	9720pa	11895au	13700pa	
0900-1000	Canada, CFRX Toronto	6005do				1000-1100	New Zealand, R NZ Intl	6100pa			
0900-1000	Canada, CFVP Calgary	6070do				1000-1100 vl	Papua New Guinea, NBC	4890do			
0900-1000	Canada, CHNX Halifax	6030do				1000-1100	Philippines, FEBC/R Intl	11635as			
0900-1000	Canada, CKZU Vancouver	6130do				1000-1100	Russia, Voice of Russia WS	7150va	9835va	11655as	11800va
0900-1000	China, China Radio Intl	6160do						12025as	15520as	17560as	17775as
0900-1000	Costa Rica, RF Peace Intl	11755pa	15440pa	17690pa				17870va			
0900-0930	Czech Rep, Radio Prague	6205am	7385am			1000-1100	Singapore, SBC Radio One	6155do			
0900-1000	Ecuador, HCJB	15640me	17485af			1000-1030	Switzerland, Swiss R Intl	6165eu	9535eu		
0900-1000 as	Eqt Guinea, R East Africa	5900pa	21455au			1000-1100	United Kingdom, BBC WS	5965na	6190af	6195va	9410eu
0900-1000 mtwhf	Eqt Guinea, Radio Africa	15186af						9740as	11750as	11760as	11940af
0900-0950	Germany, Deutsche Welle	15186af						12095eu	15070va	15190sa	15280va
		6160as	9565af	12055as	15225af			15310as	15400af	15575va	17640va
		15410af	17800af	21600af	21680as			17705va	17790as	17830va	17885af
0900-0915 mtwtf	Ghana, Ghana Broad Corp	4915do				1000-1100	USA, KAIJ Dallas TX	5810am			
0900-0915	Guam, TWR/KTWR	3366do				1000-1100	USA, KTBN Salt Lk City UT	7510am			
0900-1000	Guam, TWR/KTWR	15200as				1000-1100	USA, KWHR Naalehu HI	9930as			
0900-1000 vl/as	Italy, IRRS	11830pa				1000-1100	USA, Monitor Radio Intl	6095ca	7395sa	9430as	13840as
0900-0930 mtwhf	Italy, IRRS	7125va				1000-1100	USA, Voice of America	5985va	6165am	7405am	9590am
0900-1000	Japan, NHK/Radio	3985va						11720va	15425va		
0900-0930 vl	Kiribati, Radio	9610as	11850au	15190as		1000-1100	USA, WGTG McCaysville GA	9400am			
0900-1000	Lebanon, Voice of Hope	9825do				1000-1100	USA, WHRI Noblesville IN	6040am	6185am		
0900-1000	Lebanon, Wings of Hope	6280va				1000-1100	USA, WJCR Upton KY	7490na	13595na		
0900-1000	Malaysia, Radio	9960va				1000-1100	USA, WWCR Nashville TN	5065am	5935am	9475am	15685am
0900-0925	Netherlands, Radio	7295do				1000-1100	USA, WYFR Okeechobee FL	5950na			
0900-1000	New Zealand, R NZ Intl	9720au	13700pa			1000-1030	Vietnam, Voice of	7360na	9840as	12020as	15010as
0900-1000 vl	Papua New Guinea, NBC	6100pa				1000-1100	Zambia, Christian Voice	6065af			
0900-1000	Russia, Voice of Russia WS	4890do				1030-1055	Austria, R Austria Intl	15450as	17870au		
		7150va	9835va	11800va	12025as	1030-1057	Czech Rep, Radio Prague	7345eu	9505eu		
		15580as				1030-1100	Finland, YLE/R Finland	13645as	15235au		
0900-0930	Switzerland, Swiss R Intl	9885pa	13685pa	17515pa		1030-1100	Guam, AWR/KSDA	9530as			
0900-1000	United Kingdom, BBC WS	6190af	6195va	9410eu	9740as	1030-1100	Netherlands, Radio	6045as	9650as	12065as	13705as
		11750as	11940af	12095eu	15070va	1030-1100	South Korea, R Korea Intl	11715am			
		15190sa	15280va	15400va	15575va	1030-1055	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me
		17640va	17705eu	17830va	17885af			9480eu	15220na		
		6065as	7180as	9580as	11760as						
0900-0915	United Kingdom, BBC WS	11955as	15310as	15360as	17790as						
		5810am	9815am								
0900-1000	USA, KAIJ Dallas TX	7510am									
0900-1000	USA, KTBN Salt Lk City UT	7395sa	7535eu	9430as	13615pa						
0900-1000	USA, Monitor Radio Intl	5825eu	7425na								
0900-1000	USA, WEWN Birmingham AL	5760am	7315am								
0900-1000	USA, WHRI Noblesville IN	7490na	13595na								
0900-1000	USA, WJCR Upton KY	9465eu									
0900-1000 smtwhf	USA, WMLK Bethel PA	2390am	3230am	5065am	5935am						
0900-1000	USA, WWCR Nashville TN	6065af									
0900-1000 vl	Zambia, Christian Voice	5975do									
0900-0910 mtwhf	Zimbabwe, Zimbabwe BC	5920eu	7165eu	9830eu							
0915-1000	Ghana, Ghana Broad Corp	6130do	7295do								
0930-0955 mtwhfa	Austria, R Austria Intl	6155eu	13730eu	15450as	17870au						
0930-1000	Canada, CKZN St John's	6160do									
0930-1000	Mongolia, R Ulan Bator	11850as	12085as								
0930-1000	Netherlands, Radio	9720au	12065pa	13705pa							
0930-1000	Philippines, FEBC/R Intl	11635as									
0938-0955 1&3rd m	Denmark, R Denmark Intl	13800va	17860va								

HAUSER'S HIGHLIGHTS CROATIA: CROATIAN RADIO

Webpage now shows English news to Eu on 5920, new 7165, 9830:

0703 M-F
0803 Sa/Su
0903 M-F

Evan John Konjicija, CA, also reports:

1303 5920, 7165 Eu, 13830 Ams
2203 5985 [sic 5895?], 7165 Eu, 13830 Ams

1000 UTC

1000-1100	Australia, Radio	5995as	7240as	9510as	9580pa
		9860pa	13605as	15170as	21725as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	4910do			
1000-1100	Australia, Defense Forces R	13525as			
1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa		
1000-1100	Costa Rica, RF Peace Intl	6205am	7385am		
1000-1100	Ecuador, HCJB	5900pa	21455au		
1000-1100 as	Eqt Guinea, R East Africa	15186af			
1000-1100 mtwhf	Eqt Guinea, Radio Africa	15186af			
1000-1100	Guam, AWR/KSDA	9370as			
1000-1100	India, All India Radio	13700as	15050as	17387au	17890as
1000-1100	Iraq, Radio Iraq Intl	13680eu			
1000-1100 vl/as	Italy, IRRS	7125va			

100 kW:

0100-0500 5895 Eu/NA, m.
0500-1130 7165 Eu/Au/As, m.
1130-2000 13830 WNA, m/Au, m.
2000-2200 11635 NA, m.
2200-0100 7165 ENA, m.

10 kW:

0100-0500 7165 Eu.
0500-0600 5895 Eu.
0500-1130 9830 Eu.
0600-1600 5920 Eu.
1130-2200 7165 Eu.

2.5 kW:

0500-1130 13830 SA, m.

English news every hour from 2100 through 0500, als

FREQUENCIES

1100-1200	Australia, Radio	5995as 9615as 15530as	7240as 9860pa 15565as	9510pa 13605as	9580pa 15170as	1100-1200	United Kingdom, BBC WS	5965na 9410eu 11760as 15070va 17640va	6190af 9580as 11940af 15220va 17705va	6195va 9740va 11955as 15310as 17830af	7180as 11750as 12095eu 15575va 17885af
1100-1200 vl	Australia, VL8A Alice Spg	2310do				1100-1130	21660af United Kingdom, BBC WS	9700au 5810am	15190sa 9815am	15400eu	17790va
1100-1200 vl	Australia, VL8K Katherine	2485do				1100-1200	USA, KAIJ Dallas TX	7510am			
1100-1200 vl	Australia, VL8T Tent Crk	4910do				1100-1200	USA, KTNB Salt Lk City UT	9930as			
1100-1200	Australia, Defense Forces R	13525as				1100-1200	USA, KWHR Naalehu HI	6095na	7395ca	9355as	9430au
1100-1200	Canada, CFCX Montreal	6005do				1100-1200	USA, Monitor Radio Intl	5985va	6110va	6165am	7405am
1100-1200	Canada, CFRX Toronto	6070do				1100-1200	USA, Voice of America	9590am	9645va	9760va	11720va
1100-1200	Canada, CFVP Calgary	6030do						15160va	15425va		
1100-1200	Canada, CHNX Halifax	6130do				1100-1200	USA, WEWN Birmingham AL	7425na			
1100-1200	Canada, CKZN St John's	6160do				1100-1200	USA, WGTG McCaysville GA	9400am			
1100-1200	Canada, CKZU Vancouver	6160do				1100-1200	USA, WHRI Noblesville IN	6040am	6185am		
1100-1200	Costa Rica, Adv World R	7375am	9725am	13750am		1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	Costa Rica, RF Peace Intl	6205am	7385am			1100-1200	USA, WWCR Nashville TN	5935am	7435am	9475am	15685am
1100-1130	Ecuador, HCJB	5900pa	12005am			1100-1200	USA, WYFR Okeechobee FL	5950na	11830na		
1100-1200 as	Eqt Guinea, R East Africa	15186af				1100-1200	Zambia, Christian Voice	6065af			
1100-1200	Eqt Guinea, Radio Africa	9530as				105-1120	Pakistan, Radio	15470as	17900eu		
1100-1150	Germany, Deutsche Welle	15370af 17860af	15410af 21600af	17715af	17800af	1130-1155	Austria, R Austria Intl	13730na			
1100-1200	Iraq, Radio Iraq Intl	13680eu				1130-1200	Bulgaria, Radio	13790as			
1100-1200 vl/as	Italy, IRRS	7125va				1130-1200 vl	China, China Radio Intl	8660as	11445as	11700as	
1100-1200	Japan, NHK/Radio	6120na	9610as	15350as		1130-1200	Ecuador, HCJB	15115na	21455am		
1100-1200	Malaysia, Radio	7295do				1130-1200	Finland, YLE/R Finland	11900na	15400na		
1100-1200 vl	Malaysia, RTM Kuching	7160do				1130-1200	Iran, VOIRI	11875me	11930me	15260af	
1100-1200 vl	Malaysia, RTM Kota Kinabalu	5980do				1130-1200 a	Monaco, Trans World Radio	7115eu			
1100-1125	Netherlands, Radio	6045as	9650as	12065as	13705as	1130-1155 s	Monaco, Trans World Radio	7115eu			
1100-1200	New Zealand, R NZ Intl	6100pa				1130-1200	Myanmar, Voice of	5990do			
1100-1150	North Korea, R Pyongyang	6575na	9975na	11335na		1130-1200	Netherlands, Radio	6045eu	7190eu		
1100-1200 vl	Palau, KHBN/Voice of Hope	9730as	9985as	15140as		1130-1200	Sweden, Radio	11650na	15240na		
1100-1200 vl	Papua New Guinea, NBC	4890do				1130-1200 as	Sweden, Radio	13740am			
1100-1200	Russia, Voice of Russia WS	4740as 15560as 17870as	11655as 16560as	15460as 17755as	15520as 17775as	1130-1200 f	Vatican State, Vatican R	15210as	15570as	17550au	
1100-1200	Singapore, SBC Radio One	6155do				1135-1140	India, All India Radio	9595do	11620do	11710do	15185do
1100-1200	Singapore, R Singapore Int	6015as	6155as			1138-1155 1&3rd m	Denmark, R Denmark Intl	7295eu	17740af		
1100-1130	Switzerland, Swiss R Intl	13635as	15415as	17515as							
1100-1200	Taiwan, Voice of Asia	7445as									

SELECTED PROGRAMS

Sundays

- 1100 USA, WEWN Birmingham AL: Worldview. Current affairs.
 1100 Costa Rica, AWR Alajuela: Wavescan. Adventist World Radio's DX/Media program.
 1100 Costa Rica, R Peace Intl: The Far Right Radio Review. See S 0400.
 1105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 1115 Costa Rica, AWR Alajuela: The Gospel. A reading from scripture.
 1130 USA, WEWN Birmingham AL: Crisis in Culture. Father George Rutler examines a current issue.
 1130 Costa Rica, R Peace Intl: RFPI Reports. See S 0430.
 1138 Netherlands, Radio: Sincerely Yours. The Sunday replacement for "Happy Station" that lets the listener comment about the RN's programming.
 1153 Netherlands, Radio: Sounds Interesting. Robert Chesal takes listener feedback and incorporates their ideas into the show.

Mondays

- 1100 Costa Rica, R Peace Intl: Living Enrichment Center. See M 0400.
 1102 Costa Rica, AWR Alajuela: Family Matters. Five minutes of guidance for parents.
 1105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 1107 Costa Rica, AWR Alajuela: Music. Recorded selections of Christian music.
 1112 Costa Rica, AWR Alajuela: Today's Family Life. A series of programs with advice for family living.
 1122 Costa Rica, AWR Alajuela: Music. See M 1107.
 1130 USA, WEWN Birmingham AL: Morning Prayer. A half-hour of devotion to begin the day.
 1130 Costa Rica, R Peace Intl: RFPI Reports. See S 0430.
 1132 Costa Rica, AWR Alajuela: The Christian Working Woman. Mary Welchel provides advice for Christian women.
 1138 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
 1138 Netherlands, Radio: Newsline. See S 0038.
 1153 Costa Rica, AWR Alajuela: Family Forum. A program of advice for youth on everyday living.
 1153 Netherlands, Radio: Research File. A program of science and technology.

Tuesdays

- 1100 Costa Rica, R Peace Intl: Alternative Radio. See T 0400.
 1102 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 1105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 1107 Costa Rica, AWR Alajuela: Music. See M 1107.

- 1112 Costa Rica, AWR Alajuela: Today's Family Life. See M 1112.
 1122 Costa Rica, AWR Alajuela: Music. See M 1107.
 1130 USA, WEWN Birmingham AL: Morning Prayer. See M 1130.
 1132 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 1138 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
 1138 Netherlands, Radio: Newsline. See S 0038.
 1153 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 1153 Netherlands, Radio: Mirror Images. Weekly magazine of music, the arts, culture, and European festivals, produced and presented by David Swatling.

Wednesdays

- 1100 USA, WEWN Birmingham AL: Blessed Among Men and Women. Fr. Hogan.
 1102 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 1105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 1107 Costa Rica, AWR Alajuela: Music. See M 1107.
 1112 Costa Rica, AWR Alajuela: Today's Family Life. See M 1112.
 1122 Costa Rica, AWR Alajuela: Music. See M 1107.
 1130 USA, WEWN Birmingham AL: Morning Prayer. See M 1130.
 1130 Costa Rica, R Peace Intl: My Green Earth. See M 0230.
 1132 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 1138 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
 1138 Netherlands, Radio: Newsline. See S 0038.
 1153 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 1154 Radio Netherlands: Documentary (1). Lessons in Revolution (3rd). Follow Holland's education system through the stories of children and teenagers.
 1154 Radio Netherlands: Documentary (2). Preparing for Atlanta — Part 1 (10th). See A 2354.
 1154 Radio Netherlands: Documentary (3). Preparing for Atlanta — Part 2 (17th). See F 1454.
 1154 Radio Netherlands: Documentary (4). Living on the Land — Part 1 (24th). See F 2354.
 1154 Radio Netherlands: Documentary (5). Living on the Land — Part 2 (31st). See H 0054.

Thursdays

- 1100 USA, WEWN Birmingham AL: A Catholic Challenge. Vatican II and you with Allan Schreck.
 1102 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 1105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 1107 Costa Rica, AWR Alajuela: Music. See M 1107.
 1112 Costa Rica, AWR Alajuela: Today's Family Life. See M 1112.
 1122 Costa Rica, AWR Alajuela: Music. See M 1107.

- 1130 USA, WEWN Birmingham AL: Morning Prayer. See M 1130.
 1130 Costa Rica, R Peace Intl: Voices of Our World. See T 0330.
 1132 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 1138 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
 1138 Netherlands, Radio: Newsline. See S 0038.
 1153 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 1153 Netherlands, Radio: Media Network. See H 0153.

Fridays

- 1100 USA, WEWN Birmingham AL: Say Yes. Dana with a time of inspiration and special music.
 1100 Costa Rica, R Peace Intl: Micro-Power Radio in the U.S.. See T 0530.
 1100 Costa Rica, R Peace Intl: The Food Not Bombs Radio Network (monthly). See T 0530.
 1102 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 1105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 1107 Costa Rica, AWR Alajuela: Music. See M 1107.
 1112 Costa Rica, AWR Alajuela: Today's Family Life. See M 1112.
 1122 Costa Rica, AWR Alajuela: Music. See M 1107.
 1130 USA, WEWN Birmingham AL: Morning Prayer. See M 1130.
 1130 Costa Rica, R Peace Intl: WINGS. See W 0530.
 1132 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 1138 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
 1138 Netherlands, Radio: Newsline. See S 0038.
 1153 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 1153 Netherlands, Radio: A Good Life. See M 1253.

Saturdays

- 1100 USA, WEWN Birmingham AL: Worldview. See S 1100.
 1100 Costa Rica, AWR Alajuela: Your Radio Doctor. A public service program presented in the interest of health.
 1100 Costa Rica, R Peace Intl: World of Radio. See S 0200.
 1105 Switzerland, Swiss R Intl: Newsnet. See S 0105.
 1115 Switzerland, Swiss R Intl: Capital Letters (2/4). See S 0115.
 1115 Switzerland, Swiss R Intl: The Name Game (1/3/5). See S 0115.
 1120 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 1130 USA, WEWN Birmingham AL: Living the Word. See W 2300.
 1130 Costa Rica, AWR Alajuela: The Quiet Hour. See M 0500.
 1130 Costa Rica, R Peace Intl: RFPI's Mailbag. See S 0230.
 1137 Netherlands, Radio: Newsline. See S 0038.
 1153 Netherlands, Radio: Weekend. See S 0053.

FREQUENCIES

1200-1300	Australia, Radio	5995pa	6050pa	6080pa	7260as	1200-1300	South Korea, R Korea Intl	7285va			
		9560as	9580pa	9615as	9710as	1200-1300	Switzerland, Swiss R Intl	6165eu	9535eu		
		11800pa	15565as			1200-1300	Taiwan, VO Free China	7130au	9610as		
1200-1300	Brazil, Radio Bras	15445na				1200-1300	United Kingdom, BBC WS	5965na	6190af	6195va	7180as
1200-1230	Bulgaria, Radio	13790as						9410eu	9580as	9740va	11750as
1200-1215	Cambodia, Natl Voice of	11940as						11760as	11940af	11955as	12095eu
1200-1300 vl	Canada, CBC N Quebec Svc	9625do						15070va	15220va	15310as	15575va
1200-1300	Canada, CFCX Montreal	6005do						17640va	17705va	17830af	17885af
1200-1300	Canada, CFRX Toronto	6070do									
1200-1300	Canada, CFVP Calgary	6030do									
1200-1300	Canada, CHNX Halifax	6130do									
1200-1300	Canada, CKZN St John's	6160do									
1200-1300	Canada, CKZU Vancouver	6160do									
1200-1259	Canada, R Canada Intl	9640am	11855am	13650am							
1200-1300	China, China Radio Intl	7385na	7410as	9715as	11660as						
		11795pa									
1200-1230 vl	China, China Radio Intl	8660as	11445as	11700as	12110as						
1200-1300	Costa Rica, Adv World R	5030am	6150am	9725am	13750am						
1200-1300	Costa Rica, RF Peace Intl	6200am	7385am	15050am							
1200-1300	Ecuador, HCJB	12005am	15115am	21455am							
1200-1300 as	Eqt Guinea, R East Africa	15186af									
1200-1300	Eqt Guinea, Radio Africa	9530as									
1200-1300	France, Radio France Intl	9805eu	11600as	11670as	13625am						
		15155eu	15195eu	15325af	15530ca						
1200-1230	Iran, VOIRI	11875me	11930me	15260af							
1200-1300	Iraq, Radio Iraq Intl	13680eu									
1200-1300 vl/as	Italy, IRRS	7125va									
1200-1300	Jordan, Radio	11970va									
1200-1300	Malaysia, Radio	7295do									
1200-1300 vl	Malaysia, RTM Kota Kinabalu	5980do									
1200-1250	Myanmar, Voice of	5990do									
1200-1300	Netherlands, Radio	6045eu	7190eu								
1200-1206	New Zealand, R NZ Intl	6100pa									
1200-1230 s	Norway, Radio Norway Intl	9590eu	13800eu	15305eu							
1200-1300 vl	Palau, KHBV/Voice of Hope	9730as	9955as	9965as	9985as						
		15140as									
1200-1255	Poland, Polish R Warsaw	6095eu	7145eu	7270eu	9525eu						
		11815eu									
1200-1300	Russia, Voice of Russia WS	4740as	4975as	11655as	11785as						
		15110as	15230as	15435as	15510as						
		15520as	17755as	17775as	17870as						
1200-1300	Singapore, SBC Radio One	6155do									
1200-1300	Singapore, R Singapore Int	6015as	6155as								

SELECTED PROGRAMS

Sundays

- 1200 USA, WEWN Birmingham AL: Sunday Mass Live. From Our Lady of the Angels Monastery.
- 1200 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
- 1225 Netherlands, Radio: Program Info. See S 0125.
- 1230 Costa Rica, AWR Alajuela: It is Written. George Vandeman examines Scripture.
- 1254 Netherlands, Radio: Siren Song. Dheera Sujan presents an in-depth current affairs story that will capture and hold your attention.

Mondays

- 1200 USA, WEWN Birmingham AL: Daily Mass Live. See S 1200.
- 1200 USA, Monitor Radio Intl: Monitor Radio News. Five minutes of the latest world news at the beginning of the hour.
- 1206 USA, Monitor Radio Intl: Monitor Radio International. News, analysis, commentary, interviews and features in a magazine format.
- 1210 Costa Rica, AWR Alajuela: Power to Cope. Advice for Christian living.
- 1225 Netherlands, Radio: Press Review. See M 0025.
- 1235 Costa Rica, AWR Alajuela: It is Written. See S 1230.
- 1238 Netherlands, Radio: Newslines. See S 0038.
- 1249 USA, Monitor Radio Intl: Letterbox. Listeners make their views known by telephone or letter to host Lisa Dale.
- 1252 USA, Monitor Radio Intl: Religious Article from the CSM. As published in the Christian Science Monitor.
- 1253 Netherlands, Radio: A Good Life. Ginger da Silva hosts a program about development in both rich and poor countries.

Tuesdays

- 1200 USA, WEWN Birmingham AL: Daily Mass Live. See S 1200.
- 1200 Costa Rica, AWR Alajuela: ADRA Update. The latest info from the Adventist Development and Relief Agency.
- 1200 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1206 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1210 Costa Rica, AWR Alajuela: Wavescan. See S 1100.

- 1225 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
- 1225 Netherlands, Radio: Press Review. See M 0025.
- 1237 Costa Rica, AWR Alajuela: Music. See M 1107.
- 1238 Netherlands, Radio: Newslines. See S 0038.
- 1249 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1252 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Wednesdays

- 1200 USA, WEWN Birmingham AL: Daily Mass Live. See S 1200.
- 1200 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
- 1200 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1206 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1225 Netherlands, Radio: Press Review. See M 0025.
- 1230 Costa Rica, AWR Alajuela: It is Written. See S 1230.
- 1238 Netherlands, Radio: Newslines. See S 0038.
- 1249 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1252 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.
- 1253 Netherlands, Radio: Sounds Interesting. See S 1153.

Thursdays

- 1200 USA, WEWN Birmingham AL: Daily Mass Live. See S 1200.
- 1200 Costa Rica, AWR Alajuela: Music. See M 1107.
- 1200 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1206 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1225 Netherlands, Radio: Press Review. See M 0025.
- 1230 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
- 1238 Netherlands, Radio: Newslines. See S 0038.
- 1249 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1252 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.
- 1253 Netherlands, Radio: Research File. See M 1153.

Fridays

- 1200 USA, WEWN Birmingham AL: Daily Mass Live. See S 1200.
- 1200 Costa Rica, AWR Alajuela: Music. See M 1107.
- 1200 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1206 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1207 Costa Rica, AWR Alajuela: ADRA Update. See T 1200.
- 1220 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
- 1225 Netherlands, Radio: Press Review. See M 0025.
- 1230 Costa Rica, AWR Alajuela: Power to Cope. See M 1210.
- 1238 Netherlands, Radio: Newslines. See S 0038.
- 1249 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1252 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.
- 1253 Netherlands, Radio: From Sapphire to Laser. Robert Green introduces a new half-hour format to this program about the people who make, record and sell music.
- 1254 Radio Netherlands: Documentary (1). Lessons in Revolution (5th). See W 1154.
- 1254 Radio Netherlands: Documentary (2). Preparing for Atlanta — Part 1 (12th). See A 2354.
- 1254 Radio Netherlands: Documentary (3). Preparing for Atlanta — Part 2 (19th). See F 1454.
- 1254 Radio Netherlands: Documentary (4). Living on the Land — Part 1 (26th). See F 2354.
- 1254 Radio Netherlands: Documentary (5). Living on the Land — Part 2 (2 Jul). See H 0054.

Saturdays

- 1200 USA, WEWN Birmingham AL: Daily Mass Live. See S 1200.
- 1200 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
- 1200 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1206 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. Discussions on how the Bible addresses the trends of thought of today.
- 1225 Netherlands, Radio: Program Info. See S 0125.
- 1230 Costa Rica, AWR Alajuela: It is Written. See S 1230.
- 1238 Netherlands, Radio: Newslines. See S 0038.

FREQUENCIES

1300-1400	Australia, Radio	5995pa	7240as	9560pa	9580pa	1300-1330	Switzerland, Swiss R Intl	7230as	7480as	13635as	15240as
		9610as	11800pa			1300-1400	United Kingdom, BBC WS	5965na	5990as	6190af	6195va
1300-1330	Australia, Radio	6060pa	6080as	9510pa				9410eu	9515va	9590va	9740as
1300-1330 mtwhfa	Belgium, R Vlaanderen Int	13610na	15540na					11750as	11760as	11940af	12095eu
1300-1320	Brazil, Radio Bras	15445na						15070va	15220am	15310as	15420af
1300-1330	Bulgaria, Radio	15620as						15575va	17640va	17705va	17830af
1300-1400 vl	Canada, CBC N Quebec Svc	9625do					17885af	21470af	21660af		
1300-1400	Canada, CFCX Montreal	6005do				1300-1400	USA, KAIJ Dallas TX	5810am	9815am		
1300-1400	Canada, CFRX Toronto	6070do				1300-1400	USA, KJES Mesquite NM	11715na			
1300-1400	Canada, CFVP Calgary	6030do				1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	Canada, CHNX Halifax	6130do				1300-1400	USA, KTNB Salt Lk City UT	7510am			
1300-1400	Canada, CKZN St John's	6160do				1300-1400	USA, Monitor Radio Intl	6095na	9355as	9455na	13840as
1300-1400	Canada, CKZU Vancouver	6160do				1300-1400	USA, Voice of America	6110va	9645va	9760va	15160va
1300-1359 mtwhfa	Canada, R Canada Intl	9640am	11855am	13650am				15425va			
1300-1400	China, China Radio Intl	7385na	9715as	11660pa		1300-1330	USA, Voice of America	11715va			
1300-1330	China, China Radio Intl	7410as				1300-1400	USA, WEWN Birmingham AL	9580na	11875na	15665eu	
1300-1400	Costa Rica, RF Peace Intl	6200am	7385am	15050am		1300-1400	USA, WGTG McCaysville GA	9400am			
1300-1330	Czech Rep, Radio Prague	11660eu	17845af			1300-1400	USA, WHRI Noblesville IN	6040am	15105am		
1300-1400	Ecuador, HCJB	12005am	15115am	21455am		1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1330	Egypt, Radio Cairo	17595as				1300-1400 s	USA, WRMI/R Miami Intl	9955am			
1300-1400 as	Eqt Guinea, R East Africa	15186af				1300-1400	USA, WRNO New Orleans LA	15420am			
1300-1400	Eqt Guinea, Radio Africa	9530as				1300-1400 as	USA, WVHA Greenbush ME	15745eu			
1300-1400	Iraq, Radio Iraq Intl	13680as				1300-1400	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1300-1330 vl/as	Italy, IRRS	7125va				1300-1400	USA, WYFR Okeechobee FL	5950na	11830na	13695na	17750na
1300-1400	Lebanon, Wings of Hope	9960va				1300-1400	Zambia, Christian Voice	6065af			
1300-1400	Malaysia, Radio	7295do				1303-1310	Croatia, Croatian Radio	5920eu	7165eu	13830am	
1300-1400 vl	Malaysia, RTM Kuching	7160do				1330-1355	Austria, R Austria Intl	6155eu	13730eu		
1300-1400 vl	Malaysia, RTM Kota Kinabalu	5980do				1330-1359 s	Canada, R Canada Intl	11855am	11935eu	15325va	21455va
1300-1325	Netherlands, Radio	6045eu	7190eu			1330-1359 mtwhfa	Canada, R Canada Intl	17820va			
1300-1400 occsnal	New Zealand, R NZ Intl	6100pa				1330-1359	Canada, R Canada Intl	9535as	11795as		
1300-1350	North Korea, R Pyongyang	9345as	9640eu	11740as	15230as	1330-1400	Guam, AWR/KSDA	9650as			
		15430as				1330-1400	India, All India Radio	11620as	13750as		
1300-1330 s	Norway, Radio Norway Intl	13800as	15340na			1330-1400 vl	Italy, IRRS	3985va			
1300-1400 vl	Palau, KHBN/Voice of Hope	9730as	9955as	9965as	9985as	1330-1400	Netherlands, Radio	9890as	13700as	15150as	
		15140as				1330-1400	Sweden, Radio	9835as	11650na	15245na	
1300-1400	Philippines, FEBC/R Intl	11995as				1330-1355	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me
1300-1356	Romania, R Romania Intl	9690eu	11940eu	15365eu	17720eu	1330-1400	Uzbekistan, R Tashkent	7190as	7285as	9715as	15295as
1300-1400	Russia, Voice of Russia WS	15340as	15460as	15560as	17755as	1330-1400	Vietnam, Voice of	7360as	9840as	12030as	
1300-1400	Singapore, SBC Radio One	6155do				1335-1345	Greece, Voice of	15175na	15650na		
1300-1400	Singapore, R Singapore Int	6015as	6155as			1338-1355 1&3rd m	Denmark, R Denmark Intl	9590va	13800va	15305va	15340va
1300-1400 mtwhf	Sri Lanka, Sri Lanka BC	15425as				1345-1400	Vatican State, Vatican R	9500as	11625au	13765au	

SELECTED PROGRAMS

Sundays

- 1300 USA, WEWN Birmingham AL: Daily Mass Live (from 1300). See S 1200.
- 1304 Czech Rep, Radio Prague: Current Affairs. People and events in the Czech Republic and editorial commentary.
- 1305 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 1306 Czech Rep, Radio Prague: The Week and Politics. See S 1236.
- 1313 Czech Rep, Radio Prague: From the Weeklies. See S 1243.
- 1319 Czech Rep, Radio Prague: What's Up. See S 1249.
- 1330 USA, WEWN Birmingham AL: The Holy Rosary (Glorious). Divine worship.
- 1338 Netherlands, Radio: Sincerely Yours. See S 1138.
- 1353 Netherlands, Radio: Sounds Interesting. See S 1153.

Mondays

- 1300 USA, WEWN Birmingham AL: The Holy Rosary (Joyful). See S 1330.
- 1304 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1305 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 1309 Czech Rep, Radio Prague: Press Review. News items and editorial comment from the Czech newspapers.
- 1315 Philippines, FEBC Manila: Fit for Living. Advice for a healthful life.
- 1330 USA, WEWN Birmingham AL: The Chaplet of Divine Mercy. See S 1330.
- 1338 Netherlands, Radio: Newsline. See S 0038.
- 1340 Philippines, FEBC Manila: Computer Corner. Five minutes of news from the world of computers.
- 1345 Philippines, FEBC Manila: Communication. A series of devotional thoughts with an impact.
- 1353 Netherlands, Radio: Research File. See M 1153.

Tuesdays

- 1300 USA, WEWN Birmingham AL: The Holy Rosary (Sorrowful). See S 1330.
- 1305 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1305 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 1323 Czech Rep, Radio Prague: What's Up. See S 1249.
- 1330 USA, WEWN Birmingham AL: The Chaplet of Divine Mercy. See S 1330.

1338 Netherlands, Radio: Newsline. See S 0038.

- 1340 Philippines, FEBC Manila: Computer Corner. See M 1340.
- 1353 Netherlands, Radio: Mirror Images. See T 1153.

Wednesdays

- 1300 USA, WEWN Birmingham AL: The Holy Rosary (Glorious). See S 1330.
- 1305 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1305 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 1310 Czech Rep, Radio Prague: Press Review. See M 1309.
- 1313 Czech Rep, Radio Prague: From the Archives. An historical look at the Czech people and their lifestyle.
- 1315 Philippines, FEBC Manila: FEBC DX Dial. A program for shortwave listening.
- 1321 Czech Rep, Radio Prague: The Arts. Focus on an a particular topic concerning Czech art.
- 1330 USA, WEWN Birmingham AL: The Chaplet of Divine Mercy. See S 1330.
- 1338 Netherlands, Radio: Newsline. See S 0038.
- 1340 Philippines, FEBC Manila: Computer Corner. See M 1340.
- 1354 Radio Netherlands: Documentary (1). Lessons in Revolution (3rd). See W 1154.
- 1354 Radio Netherlands: Documentary (2). Preparing for Atlanta — Part 1 (10th). See A 2354.
- 1354 Radio Netherlands: Documentary (3). Preparing for Atlanta — Part 2 (17th). See F 1454.
- 1354 Radio Netherlands: Documentary (4). Living on the Land — Part 1 (24th). See F 2354.
- 1354 Radio Netherlands: Documentary (5). Living on the Land — Part 2 (31st). See H 0054.

Thursdays

- 1300 USA, WEWN Birmingham AL: The Holy Rosary (Joyful). See S 1330.
- 1305 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1305 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 1311 Czech Rep, Radio Prague: Press Review. See M 1309.
- 1319 Czech Rep, Radio Prague: I'd Like You to Meet. A studio interview with an interesting Czech personality.

- 1330 USA, WEWN Birmingham AL: The Chaplet of Divine Mercy. See S 1330.

- 1338 Netherlands, Radio: Newsline. See S 0038.
- 1340 Philippines, FEBC Manila: Computer Corner. See M 1340.
- 1352 Netherlands, Radio: Media Network. See H 0153.

Fridays

- 1300 USA, WEWN Birmingham AL: The Holy Rosary (Sorrowful). See S 1330.
- 1305 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 1306 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1311 Czech Rep, Radio Prague: Press Review. See M 1309.
- 1314 Czech Rep, Radio Prague: Calling All Listeners. Information about the Czech Republic, commentary on listener letters, and occasional DX news.
- 1330 USA, WEWN Birmingham AL: The Chaplet of Divine Mercy. See S 1330.
- 1338 Netherlands, Radio: Newsline. See S 0038.
- 1340 Philippines, FEBC Manila: Computer Corner. See M 1340.
- 1345 Philippines, FEBC Manila: Mailbag. Letters are read and answered on the air.
- 1355 Netherlands, Radio: A Good Life. See M 1253.

Saturdays

- 1300 USA, WEWN Birmingham AL: The Holy Rosary (Glorious). See S 1330.
- 1304 Czech Rep, Radio Prague: Live in Prague. See S 0004.
- 1305 Switzerland, Swiss R Intl: Newsnet. See S 0105.
- 1315 Switzerland, Swiss R Intl: Capital Letters (2/4). See S 0115.
- 1315 Switzerland, Swiss R Intl: The Name Game (1/3/5). See S 0115.
- 1330 USA, WEWN Birmingham AL: The Chaplet of Divine Mercy. See S 1330.
- 1338 Netherlands, Radio: Newsline. See S 0038.
- 1340 Philippines, FEBC Manila: Computer Corner. See M 1340.
- 1353 Netherlands, Radio: Weekend. See S 0053.

FREQUENCIES

1400-1430	Australia, Radio	7240as	9560as	9610pa	11695pa	1400-1500	Singapore, SBC Radio One	6155do			
1400-1500	Australia, Radio	5995pa	9580pa	9615as	11800pa	1400-1500	Sri Lanka, Sri Lanka BC	15425as			
1400-1500	Australia, Defense Forces R	8743af	10623af			1400-1500	United Kingdom, BBC WS	5990as	6190af	6195va	7205as
1400-1500 vl	Canada, CBC N Quebec Svc	9625do						9410eu	9515na	9590va	9740va
1400-1500	Canada, CFCX Montreal	6005do						11750as	11865am	11940af	12095eu
1400-1500	Canada, CFRX Toronto	6070do						15070va	15220am	15260na	15575va
1400-1500	Canada, CFVP Calgary	6030do						17640va	17705va	17830af	17840va
1400-1500	Canada, CHNX Halifax	6130do						21660af			
1400-1500	Canada, CKZN St John's	6160do					21470af				
1400-1500	Canada, CKZU Vancouver	6160do				1400-1500	USA, KAIJ Dallas TX	13815am	15725am		
1400-1459	Canada, R Canada Intl	11855au	13650am			1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	China, China Radio Intl	7405na	9530as	9785as		1400-1500	USA, KTNB Salt Lk City UT	7510am			
1400-1500	Costa Rica, RF Peace Intl	6200am	7385am	15050am		1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	Ecuador, HCJB	21455am				1400-1500	USA, Voice of America	6110va	7125as	7215as	9645as
1400-1430	Ecuador, HCJB	12005am	15115am					9760va	15255va	15395as	15425va
1400-1500 as	Eq Guinea, R East Africa	15186af				1400-1500	USA, WEWN Birmingham AL	9580na	11875na	15665eu	
1400-1500	France, Radio France Intl	7110as	15405as	17560me		1400-1500	USA, WGTG McCaysville GA	9400am			
1400-1500	India, All India Radio	11620as	13750as			1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1430	Israel, Kol Israel	12077va	15615na			1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500 vl	Italy, IRRS	3985va				1400-1500 as	USA, WRNO New Orleans LA	15420am			
1400-1500	Japan, NHK/Radio	9535na	11705na	11895as	11915na	1400-1500	USA, WVHA Greenbush ME	15745eu			
1400-1500	Lebanon, Wings of Hope	9960va				1400-1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400-1500	Malaysia, Radio	7295do				1400-1500	USA, WYFR Okeechobee FL	5950na	11550as	11830na	15130am
1400-1500 vl	Malaysia, RTM Kuching	7160do						17750eu			
1400-1500 vl	Malaysia, RTM Kota Kinabalu	5980do				1400-1415	Vatican State, Vatican R	9500as	11625as	13765au	
1400-1430 vl	Mexico, Radio Mexico Intl	9705na				1400-1500	Zambia, Christian Voice	6065af			
1400-1500	Netherlands, Radio	9890as	13700as	15150as		1415-1500 mtwhfa	Bhutan, Bhutan BC Service	5023do			
1400-1500 occsnal	New Zealand, R NZ Intl	6100pa				1415-1425	Nepal, Radio	7165do			
1400-1500 vl	Palau, KHBN/Voice of Hope	9730as	9955as	9965as	9985as	1430-1500	Australia, Radio	6060na	6080as	6090me	11660eu
		15140as						11695pa	12080pa		
1400-1500	Philippines, FEBC/R Intl	11995as				1430-1440	China, China Radio Intl	8660as	9880as	11445as	15135as
1400-1500	Russia, Voice of Russia WS	4740me	4940me	7225me	9595me	1430-1440 mtwhf	India, All India Radio	3945do	6185do	9565do	9685do
		9705me	11835me	11945me	11985me	1430-1500 mtwhf	Indonesia, RRI Uj Pandang	4753do			
		15320me	15350me	15430me	15540me	1430-1500	Portugal, R Portugal Intl	21515me			
		15560me				1430-1500	Romania, R Romania Intl	11775as	15335as		
						1430-1500	United Kingdom, BBC WS	15400af			
						1438-1455 1&3rd m	Denmark, R Denmark Intl	13800na	15340as		
						1440-1500	Myanmar, Voice of	5990do			
						1458-1500	Seychelles, FEBA Radio	9870as	11870as		

SELECTED PROGRAMS

Sundays

- 1400 Philippines, FEBC Manila: The Bible Speaks. Music and principles to live by.
- 1400 Radio Mexico Intl: Mailbag. A typical mailbag program in which letters from English-speaking listeners are discussed on the air.
- 1400 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 1425 Netherlands, Radio: Program Info. See S 0125.
- 1438 Netherlands, Radio: Sincerely Yours. See S 1138.
- 1440 Philippines, FEBC Manila: The Way to Life. Dick Saunders explores the Bible.
- 1454 Netherlands, Radio: Siren Song. See S 1254.

Mondays

- 1400 USA, WEWN Birmingham AL: The Catechism Explained. Douglas Bushman discusses Catholic dogma.
- 1400 Radio Mexico Intl: Antenna Radio Summary. A 15-minute magazine of news, finance, and culture.
- 1415 Radio Mexico Intl: Orchestral Music. The music of Mexico in an easy listening format.
- 1425 Netherlands, Radio: Program Info. See S 0125.
- 1430 USA, WEWN Birmingham AL: Crisis in Culture. See S 1130.
- 1435 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 1438 Netherlands, Radio: Newline. See S 0038.
- 1440 Philippines, FEBC Manila: The Way to Life. See S 1440.
- 1445 Philippines, FEBC Manila: Words of Truth. A Bible study program.
- 1453 Netherlands, Radio: A Good Life. See M 1253.

Tuesdays

- 1400 USA, WEWN Birmingham AL: Pillars of Faith (encore). Bishop D. Foley.
- 1400 Radio Mexico Intl: Antenna Radio Summary. See M 1400.
- 1415 Radio Mexico Intl: Orchestral Music. See M 1415.
- 1425 Netherlands, Radio: Program Info. See S 0125.
- 1435 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 1438 Netherlands, Radio: Newline. See S 0038.
- 1440 Philippines, FEBC Manila: The Way to Life. See S 1440.
- 1445 Philippines, FEBC Manila: Words of Truth. See M 1445.
- 1453 Netherlands, Radio: African Season. See T 1253.

Wednesdays

- 1400 USA, WEWN Birmingham AL: Go Into the Whole World. Father Pablo Staub.
- 1400 Radio Mexico Intl: Antenna Radio Summary. See M 1400.
- 1415 Radio Mexico Intl: Orchestral Music. See M 1415.
- 1425 Netherlands, Radio: Program Info. See S 0125.
- 1430 USA, WEWN Birmingham AL: Survey of Theology. Bishop Hastrich.
- 1435 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 1438 Netherlands, Radio: Newline. See S 0038.
- 1440 Philippines, FEBC Manila: The Way to Life. See S 1440.
- 1445 Philippines, FEBC Manila: Words of Truth. See M 1445.
- 1453 Netherlands, Radio: Sounds Interesting. See S 1153.

Thursdays

- 1400 USA, WEWN Birmingham AL: Christ the Light of the Nations. See S 1530.
- 1400 Radio Mexico Intl: Antenna Radio Summary. See M 1400.
- 1415 Radio Mexico Intl: Orchestral Music. See M 1415.
- 1425 Netherlands, Radio: Program Info. See S 0125.
- 1430 USA, WEWN Birmingham AL: You and the God of Mercy. Father Groeschel.
- 1435 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 1438 Netherlands, Radio: Newline. See S 0038.
- 1440 Philippines, FEBC Manila: The Way to Life. See S 1440.
- 1445 Philippines, FEBC Manila: Words of Truth. See M 1445.
- 1453 Netherlands, Radio: Research File. See M 1153.

Fridays

- 1400 Radio Mexico Intl: Antenna Radio Summary. See M 1400.
- 1425 Netherlands, Radio: Program Info. See S 0125.
- 1435 Philippines, FEBC Manila: Guidelines for Living. See M 0100.
- 1438 Netherlands, Radio: Newline. See S 0038.
- 1440 Philippines, FEBC Manila: The Way to Life. See S 1440.
- 1445 Philippines, FEBC Manila: Words of Truth. See M 1445.
- 1452 Netherlands, Radio: From Sapphire to Laser. See F 1253.
- 1454 Radio Netherlands: Documentary (1). Lessons in Revolution (5th). See W 1154.
- 1454 Radio Netherlands: Documentary (2). Preparing for Atlanta — Part 1 (12th). See A 2354.

- 1454 Radio Netherlands: Documentary (3). Preparing for Atlanta — Part 2 (19th). Howard Shannon looks at the last minute coaching just days before flying out.
- 1454 Radio Netherlands: Documentary (4). Living on the Land — Part 1 (26th). See F 2354.
- 1454 Radio Netherlands: Documentary (5). Living on the Land — Part 2 (2 Jul). See H 0054.

Saturdays

- 1400 Philippines, FEBC Manila: Communication. See M 1345.
- 1400 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 1415 Philippines, FEBC Manila: Far East Forum. A weekly news magazine about politics, trade, and religion.
- 1425 Netherlands, Radio: Program Info. See S 0125.
- 1438 Netherlands, Radio: Newline. See S 0038.
- 1440 Philippines, FEBC Manila: The Way to Life. See S 1440.

International Callsign Directory

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FREQUENCIES

1600-1700	Australia, Radio	5995pa 7260as 11695pa	6060pa 9580pa 11800pa	6080pa 9615va 11660pa	6090pa	1600-1700	South Korea, R Korea Intl	5975eu 9720as 9500af	9515af 15425as	9870af
1600-1700 vl	Canada, CBC N Quebec Svc	9625do				1600-1630 mtwhf	Sri Lanka, Sri Lanka BC			
1600-1700	Canada, CFCX Montreal	6005do				1600-1700	Swaziland, Trans World R			
1600-1700	Canada, CFRX Toronto	6070do				1600-1640	UAE, Radio Dubai	11795me	13675eu	15395me 17825me
1600-1700	Canada, CFPV Calgary	6030do				1600-1700	United Kingdom, BBC WS	3915as 9410va 11750as 15420af	6190af 9515na 12095va 17840va	6195va 7135as 9590na 9740va 15070va 15400af 21470af 21660af
1600-1700	Canada, CHNX Halifax	6130do						5990as	7180as	7205as 17705va
1600-1700	Canada, CKZU St John's	6160do				1600-1615	United Kingdom, BBC WS	17830af		
1600-1700	Canada, CKZU Vancouver	6160do				1600-1700	USA, KAIJ Dallas TX	13815am	15725am	
1600-1700	China, China Radio Intl	11575as	15110af	15130af		1600-1700	USA, KTNB Salt Lk City UT	15590am		
1600-1700	Costa Rica, RF Peace Intl	6200am	15050am			1600-1700	USA, KWHR Naalehu HI	6120as		
1600-1627	Czech Rep, Radio Prague	5930eu	17485af			1600-1700	USA, Monitor Radio Intl	9385eu	15715eu	17510af 18930af
1600-1630	Ethiopia, Radio	7165af				1600-1700	USA, Voice of America	7125as 11920af 15225af	7215as 12040af 15255va	9645as 9700va 13710af 15205va 15395as 15410af
1600-1700	France, Radio France Intl	6175eu 15210af	11615me 15460af	11700af 15530af	12015af			15445af	17895af	
1600-1650	Germany, Deutsche Welle	7225as	9875as	13690as		1600-1630 as	USA, Voice of America	6035af		
1600-1700	Germany, Deutsche Welle	7185af	9735af	11965af	17800af	1600-1700	USA, WEWN Birmingham AL	11875na	13615na	15665eu
1600-1700	Guam, AWR/KSDA	7395as				1600-1700	USA, WGTG McCaysville GA	9400am		
1600-1615 mt	Guam, TWR/KTWR	11580as				1600-1700	USA, WHRI Noblesville IN	13760am	15105am	
1600-1630 whtas	Guam, TWR/KTWR	11580as				1600-1700	USA, WJCR Upton KY	7490na	13595na	
1600-1630	Iran, VOIRI	7290as	9635as			1600-1700	USA, WRNO New Orleans LA	15420am		
1600-1700 vl	Italy, IRRS	3985va				1600-1700 as	USA, WVHA Greenbush ME	15745eu		
1600-1700	Jordan, Radio	11970va				1600-1700	USA, WWCR Nashville TN	9475am	12160am	13845am 15685am
1600-1700	Lebanon, Voice of Hope	6280va				1600-1700	USA, WYFR Okeechobee FL	11705na 21525af	11830na 21745eu	15695eu 17750eu
1600-1700	Malaysia, Radio	7295do				1600-1630 a	Vatican State, Vatican R	9940as	11640af	
1600-1630 vl	Mexico, Radio Mexico Intl	9705na				1600-1630	Vietnam, Voice of	7360na	9840eu	12030as
1600-1625	Netherlands, Radio	9890as	13700as	15150as		1600-1700	Zambia, Christian Voice	6065af		
1600-1650 occsnal	New Zealand, R NZ Intl	6100am				1615-1630	Albania, R Tirana Intl	7155eu	9740eu	
1600-1630 s	Norway, Radio Norway Intl	11840na	11860eu	13805eu		1615-1700	United Kingdom, BBC WS	9510as	11860af	
1600-1630	Pakistan, Radio	9425af 13590af	9515af 15555af	11570af	11935af	1615-1630	Vatican State, Vatican R	7250au	9645eu	11810eu
1600-1700 vl	Palau, KHBN/Voice of Hope	9955as	9965as	9985as		1630-1659	Canada, R Canada Intl	7150as	9550as	
1600-1700	Russia, Voice of Russia WS	7240eu 9480eu 9975eu 11945me 17875af	7325af 9830va 11630eu 12025af	7350eu 9955eu 11675eu 15350va	7440af 9955me 11775me 15400eu	1630-1700	Egypt, Radio Cairo	15255af		
1600-1700	S Africa, Channel Africa	7155af	9530af			1630-1700	Slovakia, Adv World Radio	15620af		
1600-1700	S Africa, Trans World R	9500af				1630-1700	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu
1600-1700	Singapore, SBC Radio One	6155do				1638-1655 1&3rd m	Denmark, R Denmark Intl	11840af	11860na	13805va 15340vs
1600-1700	Slovakia, Adv World Radio	13590as				1645-1700 mtwhf	Canada, R Canada Intl	9555va	11935va	15325eu 17820eu
						1650-1700	Eqt Guinea, Radio Africa	15186af		
						1650-1700 mtwhf	New Zealand, R NZ Intl	6145pa		

SELECTED PROGRAMS

Sundays

- 1600 USA, WEWN Birmingham AL: Spanish Mass (live). Catholic Mass in Spanish.
- 1600 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 1604 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1606 Czech Rep, Radio Prague: The Week and Politics. See S 1236.
- 1613 Czech Rep, Radio Prague: From the Weeklies. See S 1243.
- 1619 Czech Rep, Radio Prague: What's Up. See S 1249.

Mondays

- 1600 USA, WEWN Birmingham AL: Catholic World Today. Glen Tapley covers the headline stories of the day from a distinctly Catholic perspective.
- 1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1604 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1606 USA, WRNO, New Orleans LA: Rush Limbaugh Program. Political talk on the conservative side.
- 1609 Czech Rep, Radio Prague: Press Review. See M 1309.
- 1630 USA, WEWN Birmingham AL: Old Testament Prophets. Father Mitch Pacwa of Loyola University focuses on the life of a prophet in each program.
- 1649 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Tuesdays

- 1600 USA, WEWN Birmingham AL: Catholic World Today. See M 1600.
- 1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1605 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1606 USA, WRNO, New Orleans LA: Rush Limbaugh Program.

- See M 1606.
- 1610 USA, WEWN Birmingham AL: Today's Faith. Today in church history followed by scripture readings.
- 1623 Czech Rep, Radio Prague: What's Up. See S 1249.
- 1630 USA, WEWN Birmingham AL: Today with Father Rutler. Father George Rutler with an historical perspective on the church and religion.
- 1649 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Wednesdays

- 1600 USA, WEWN Birmingham AL: Catholic World Today. See M 1600.
- 1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1605 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1606 USA, WRNO, New Orleans LA: Rush Limbaugh Program. See M 1606.
- 1610 Czech Rep, Radio Prague: Press Review. See M 1309.
- 1613 Czech Rep, Radio Prague: From the Archives. See W 1313.
- 1621 Czech Rep, Radio Prague: The Arts. See W 1321.
- 1630 USA, WEWN Birmingham AL: Mercy Our Mission. Fathers Hal Cohen and George Kosicki talk about intercession.
- 1649 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Thursdays

- 1600 USA, WEWN Birmingham AL: Catholic World Today. See M 1600.
- 1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1605 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1606 USA, WRNO, New Orleans LA: Rush Limbaugh Program. See M 1606.

- 1609 Czech Rep, Radio Prague: Press Review. See M 1309.
- 1617 Czech Rep, Radio Prague: I'd Like You to Meet. See H 1319.
- 1630 USA, WEWN Birmingham AL: LiveWire (encore). Repeat of live call-in program.
- 1649 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Fridays

- 1600 USA, WEWN Birmingham AL: Catholic World Today. See M 1600.
- 1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1606 Czech Rep, Radio Prague: Current Affairs. See S 1304.
- 1606 USA, Monitor Radio Intl: Monitor Radio International. See M 1206.
- 1606 USA, WRNO, New Orleans LA: Rush Limbaugh Program. See M 1606.
- 1611 Czech Rep, Radio Prague: Press Review. See M 1309.
- 1614 Czech Rep, Radio Prague: Calling All Listeners. See F 1314.
- 1649 USA, Monitor Radio Intl: Letterbox. See M 1249.
- 1652 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1252.

Saturdays

- 1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1200.
- 1600 USA, WRNO, New Orleans LA: The Overcomer Broadcast. See S 0000.
- 1604 Czech Rep, Radio Prague: Live in Prague. See S 0004.
- 1606 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See A 1206.
- 1630 USA, WRNO, New Orleans LA: American Dissident Voices. See S 0100.

FREQUENCIES

1700-1800	Australia, Radio	6060pa 9580pa 11695pa	6080pa 9615as 11880pa	6090pa 9860pa	7260as 11660pa	1800-1900 Algeria, R Algiers Intl	11715me	15160eu	15205eu	7260eu
1700-1800 vl	Canada, CBC N Quebec Svc	9625do				1800-1900 Australia, Radio	6060pa 9580pa 11880pa	6080pa 9860pa 11660as	6090pa 11695pa	
1700-1800	Canada, CFCX Montreal	6005do				1800-1825	Belgium, R Vlaanderen Int	5910eu	13645af	
1700-1800	Canada, CFRX Toronto	6070do				1800-1900	Brazil, Radio Bras	15265eu		
1700-1800	Canada, CFVP Calgary	6030do				1800-1900	Canada, CFCX Montreal	6005do		
1700-1800	Canada, CHNX Halifax	6130do				1800-1900	Canada, CFRX Toronto	6070do		
1700-1800	Canada, CKZN St John's	6160do				1800-1900	Canada, CFVP Calgary	6030do		
1700-1800	Canada, CKZU Vancouver	6160do				1800-1900	Canada, CHNX Halifax	6130do		
1700-1800	China, China Radio Intl	5220af 11575af	7150af	7405af	9535as	1800-1900	Canada, CKZN St John's	6160do		
1700-1800 as	Costa Rica, Adv World R	13750am				1800-1900	Canada, CKZU Vancouver	6160do		
1700-1800	Costa Rica, RF Peace Intl	6200am	15050am			1800-1900	Costa Rica, RF Peace Intl	6200am	15050am	
1700-1727	Czech Rep, Radio Prague	5835eu	15640af			1800-1830	Ecuador, HCJB	15540eu	21455eu	
1700-1800	Ecuador, HCJB	15540eu	21455eu			1800-1900	Egypt, Radio Cairo	15255af		
1700-1800	Egypt, Radio Cairo	15255af				1800-1900	Egt Guinea, Radio Africa	15186af		
1700-1800	Egt Guinea, Radio Africa	15186af				1800-1900	India, All India Radio	7410eu	9650eu	9950af
1700-1730	France, Radio France Intl	6175eu 15210af	11615me 15460af	11700af 15530af	12015af	1800-1900 vl	Italy, IRRS	11935me	13750as	15075as
1700-1800 vl	Italy, IRRS	3985va				1800-1900	Kuwait, Radio	3985va		
1700-1800	Japan, NHK/Radio	6035na	9535na	9580as	11880as	1800-1900	Lebanon, Voice of Hope	11990na		
1700-1730	Jordan, Radio	11970va				1800-1825	Netherlands, Radio	6280va		
1700-1800	Lebanon, Voice of Hope	6280va				1800-1900 mtwhf	New Zealand, R NZ Intl	6020af	7120af	11655af
1700-1730	Lebanon, Wings of Hope	9960va				1800-1830 s	Norway, Radio Norway Intl	6145pa		
1700-1800 mtwhf	New Zealand, R NZ Intl	6145pa				1800-1900	Russia, Voice of Russia WS	7485af	9590af	13805af
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9975af	13785me	1800-1900	Sudan, Radio Omdurman	7240eu	7350eu	9480eu
1700-1750	Pakistan, Radio	9400eu	11570eu			1800-1830	Swaziland, Trans World R	9665va	9830va	9955af
1700-1800 vl	Palau, KHBN/Voice of Hope	9955as	9965as	9985as		1800-1900	Swaziland, Trans World R	9975af	11630af	11765af
1700-1755	Poland, Polish R Warsaw	6095eu	7270eu	7285eu		1800-1900	United Kingdom, BBC WS	11945af	11960af	15400eu
1700-1800	Russia, Voice of Russia WS	7440af 9955af 12065me	9480eu 9975af 15400eu	9830va 11775va 17875af	9880eu 11960va	1800-1830	United Kingdom, BBC WS	9000af	9025af	
1700-1755	S Africa, Channel Africa	3220af	7155af			1800-1900	Swaziland, Trans World R	9500af		
1700-1730	Sri Lanka, Sri Lanka BC	15425as				1800-1900	Swaziland, Trans World R	3200af		
1700-1800	Swaziland, Trans World R	9500af				1800-1900	United Kingdom, BBC WS	3255af	3955eu	6180eu
1700-1730	Switzerland, Swiss R Intl	9505eu	9885me	9905eu	12075af	1800-1830	USA, KAIJ Dallas TX	6195eu	9410va	12095eu
1700-1800	United Kingdom, BBC WS	13635af				1800-1900	USA, KJES Mesquite NM	15400af	15420af	17830af
1700-1745	United Kingdom, BBC WS	3955eu	6190af	6195eu	7150eu	1800-1900	USA, KTNB Salt Lk City UT	7150eu	7160va	9510as
1700-1715	United Kingdom, BBC WS	9410va	9710as	9740as	11750as	1800-1900	USA, KWHR Naalehu HI	13815am	15725am	
1700-1800	USA, KAIJ Dallas TX	11760as	11860af	15070va	15400af	1800-1900	USA, Monitor Radio Intl	15385na		
1700-1800	USA, KTNB Salt Lk City UT	15420af	17830af	17840va		1800-1900	USA, Voice of America	15590am		
1700-1800	USA, KWHR Naalehu HI	3915as	7135as	9630af	12095va	1800-1900	USA, WEWN Birmingham AL	13625au		
1700-1800	USA, Monitor Radio Intl	6120as				1800-1900	USA, WGTG McCaysville GA	9385eu	13770va	15665af
1700-1800	USA, Voice of America	9385eu	15715eu	17510af		1800-1900	USA, WHRI Noblesville IN	6035va	9760va	9770va
1700-1800	USA, Voice of America	6035as	7125as	7215as	9645as	1800-1900	USA, WJCR Upton KY	12040af	13710af	15410af
1700-1800	USA, Voice of America	9700va	9760va	11920af	12040af	1800-1900	USA, WMLK Bethel PA	15420am	13615na	15745eu
1700-1800	USA, Voice of America	13710af	15255va	15395as	15410af	1800-1900	USA, WRMI/R Miami Intl	9495am	13760eu	
1700-1800	USA, Voice of America	15445af	17895af			1800-1900	USA, WRNO New Orleans LA	7490na	13595na	
1700-1800 mtwhf	USA, Voice of America	5990va	6045va	7125as	7150va	1800-1900	USA, WVHA Greenbush ME	9465eu		
1700-1800	USA, WEWN Birmingham AL	7170va	9550va	9770va	11870va	1800-1900	USA, WWCN Nashville TN	9475am	12160am	13845am
1700-1800	USA, WGTG McCaysville GA	11875na	13615na	15665eu		1800-1900 vl	USA, WYFR Okeechobee FL	9400am	15695eu	17555eu
1700-1800	USA, WHRI Noblesville IN	9400am				1802-1900 s	Vietnam, Voice of	9495am	15695eu	17555eu
1700-1800	USA, WJCR Upton KY	13760am	15105ca			1803-1810	Yemen, Yemeni Rep Radio	12040af	9840eu	12030as
1700-1800	USA, WJCR Upton KY	7490na	13595na			1803-1810	Yemen, Yemeni Rep Radio	9780as		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu				1803-1900	Zimbabwe, Zimbabwe BC	4828do		
1700-1800	USA, WRNO New Orleans LA	15420am				1803-1900	Morocco, RTVM Marocaine	17815af		
1700-1800	USA, WWCN Nashville TN	9475am	12160am	13845am	15685am	1803-1900	Croatia, Croatian Radio	5920eu	7165eu	9830eu
1700-1800	USA, WYFR Okeechobee FL	15695eu	17555eu			1803-1900	Bangladesh, Radio	7190eu	9568as	15520as
1700-1800	Zambia, Christian Voice	4965af				1803-1900	Albania, R Tirana Intl	7270eu	9740eu	
1700-1800 vl	Zimbabwe, Zimbabwe BC	4828do				1803-1900	Georgia, Radio	6080eu		
1715-1800	United Kingdom, BBC WS	7160va				1803-1900	Netherlands, Radio	6020af	7120af	9860af
1730-1755	Austria, R Austria Intl	6155eu	9665me	11780as	13730eu	1830-1857	S Africa, Trans World R	13700af	15315af	17605af
1730-1800	Georgia, Radio	6080eu				1830-1900	Serbia, Radio Yugoslavia	9525af		
1730-1800	Guam, AWR/KSDA	9370as				1830-1900	Slovakia, R Slovakia Intl	6100eu	9720eu	
1730-1800	Netherlands, Radio	6020af	7120af	11655af		1830-1855 irreg	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu
1730-1755	Romania, R Romania Intl	9550af	9750af	11830af	11940af	1830-1900	Somalia, Radio Mogadishu	6710af		
1730-1800	United Kingdom, BBC WS	6180eu				1830-1900	South Korea, R Korea Intl	3955eu		
1730-1800	Vatican State, Vatican R	9660af	11625af	15570af		1830-1900	Sweden, Radio	6065va	9430va	9655va
1738-1755 1&3rd m	Denmark, R Denmark Intl	7485va	11860va	15220va		1830-1900	Turkey, Voice of	9445na	9535na	
1745-1800 mtwhf	Armenia, Voice of	4810eu	4990eu	7490eu	9965eu	1830-1900	United Kingdom, BBC WS	6005af	9630af	9740va
1745-1800	India, All India Radio	7410eu	9650eu	9950af	11620af	1833-1900	Cote D' Ivoire, RDTV	11920do		
1745-1800	Swaziland, Trans World R	11935af	13750as	15075me		1838-1855 1&3rd m	Denmark, R Denmark Intl	7485eu	9590eu	13805va
		3200af				1840-1850	Greece, Voice of	11645af	15150af	15220va
						1845-1900 t	Belarus, Radiostars Belarus	7180eu	7210eu	9875eu
						1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do

FREQUENCIES

1900-2000 mtwhf	Argentina, RAE	15335eu				2000-2100	Algeria, R Algiers Intl	11715me	15160eu		
1900-2000	Australia, Radio	6080pa	6150as	7240pa		2000-2100	Angola, Radio Nacional	3355do	9535do		
		7260as	9560as	9580pa	9860pa	2000-2100	Australia, Radio	6060pa	6080pa	6150pa	7260as
		11660pa	11695pa	11880pa				9580pa	9860pa	11660pa	11695pa
								11855as	11880pa	12080pa	
1900-1930	Azerbaijan, Voice of	4957eu				2000-2100	Canada, CFCX Montreal	6005do			
1900-1920	Brazil, Radio Bras	15265eu				2000-2100	Canada, CFRX Toronto	6070do			
1900-2000	Bulgaria, Radio	9700eu	11720eu			2000-2100	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CFCX Montreal	6005do				2000-2100	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CFRX Toronto	6070do				2000-2100	Canada, CKZN St John's	6160do			
1900-2000	Canada, CFVP Calgary	6030do				2000-2100	Canada, CKZU Vancouver	6160do			
1900-2000	Canada, CHNX Halifax	6130do				2000-2059	Canada, R Canada Intl	5995va	7235va	11690va	13650eu
1900-2000	Canada, CKZN St John's	6160do					13670eu 15150eu	15325eu	17820eu	17870eu	
1900-2000	Canada, CKZU Vancouver	6160do				2000-2100	China, China Radio Intl	6950eu	9440af	9920eu	11715af
1900-2000	China, China Radio Intl	6955me	9440af					15110af			
1900-2000	Costa Rica, Adv World R	13750am	15460am			2000-2100	Costa Rica, RF Peace Intl	6200am	15050am		
1900-2000	Costa Rica, RF Peace Intl	6200am	15050am			2000-2027	Czech Rep., Radio Prague	5930va	11600va		
1900-1930	Cote d'Ivoire, RDTV	11920do				2000-2100	Ecuador, HCJB	15540eu	21455eu		
1900-2000	Ecuador, HCJB	15540eu	21455eu			2000-2100	Egt Guinea, Radio Africa	15186af			
1900-2000	Egt Guinea, Radio Africa	15186af				2000-2050	Germany, Deutsche Welle	7170eu	9615eu		
1900-1930 mt	Estonia, Radio	5925eu				2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
1900-1950	Germany, Deutsche Welle	9735af	11740af	11785af	13690af	2000-2010	Greece, Voice of	7430eu			
		13790af				2000-2100	Guatemala, Adv World R	5980am			
1900-2000	Guatemala, Adv World R	5980am				2000-2100	Indonesia, Voice of	9525as			
1900-1930	Hungary, Radio Budapest	3975eu	6140eu	7130eu	9835eu	2000-2030	Iran, VOIRI	7260af	9022eu		
1900-1945	India, All India Radio	7410eu	9650eu	9950me	11620eu	2000-2100 vi/fas	Italy, IRRS	3980va			
		11935af	13750as	15075as		2000-2100 vi	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
1900-1930	Israel, Kol Israel	7465na	9435eu	11605na	15615na	2000-2100	Kuwait, Radio	11990eu			
		15640sa				2000-2100	Lebanon, Wings of Hope	9960va			
1900-2000 vi	Italy, IRRS	3985va				2000-2030	Lithuania, Radio Vilnius	9710eu			
1900-2000	Japan, NHK/Radio	6035as	7140pa	9535na	9580as	2000-2030 vi	Mexico, Radio Mexico Intl	9705na			
1900-2000 vi	Kenya, Kenya Broadc Corp	4885do	4935do	6150do		2000-2025	Netherlands, Radio	7120af	7205af	7895af	9860af
1900-2000	Kuwait, Radio	11990eu						11655af	15315af	17605af	
1900-1930 as	Latvia, Radio	5935eu				2000-2006 fa	New Zealand, R NZ Intl	9810pa			
1900-2000	Lebanon, Wings of Hope	9960va				2000-2048 smtwh	New Zealand, R NZ Intl	9810pa			
1900-1930 vi	Mexico, Radio Mexico Intl	9705na				2000-2005	Nigeria, FRCN/Radio	3326do	4990do		
1900-2000	Netherlands, Radio	6020af	7120af	9860af	9895af	2000-2050	North Korea, R Pyongyang	6575eu	9345as	9640af	9975as
		11655af	13700af	15315af	17605af	2000-2030 s	Norway, Radio Norway Intl	9590au			
1900-1952 mtwhf	New Zealand, R NZ Intl	6145pa				2000-2100 vi	Papua New Guinea, NBC	4890do			
1900-1956	Romania, R Romania Intl	9550eu	9690eu	11810eu	11940eu	2000-2025	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
1900-2000	Russia, Voice of Russia WS	7440af	9480eu	9665va	11630af	2000-2030 mtwhf	Portugal, R Portugal Intl	6130eu	9780eu	9815eu	15515af
		11675eu	11765af	11785af	11945af	2000-2100	Russia, Voice of Russia WS	7070eu	9480eu	9880eu	11630eu
		15400eu	17875af					11675eu			
1900-2000	South Korea, R Korea Intl	5975eu				2000-2015	Sierra Leone, SLBS	3316do			
1900-2000	Swaziland, Trans World R	3200af				2000-2015	Swaziland, Trans World R	3200af			
1900-1930	Switzerland, Swiss R Intl	6165eu				2000-2030	Switzerland, Swiss R Intl	6165eu	9870af	9885af	9905af
1900-2000	Thailand, Radio	7210eu						11640af			
1900-1930	Turkey, Voice of	9445na	9535na			2000-2015	Uganda, Radio	3340do	4976do		
1900-2000	United Kingdom, BBC WS	3255af	3955eu	5975me	6005af	2000-2100	United Kingdom, BBC WS	3255af	3955eu	5975me	6005af
		6180eu	6190af	6195va	9410va			6195va	7325eu	9410va	9630af
		9630af	9740va	15070af	15400af			11835va	11955as	12095eu	15070eu
		17830af									
1900-2000	USA, KAIJ Dallas TX	13815af	15725am			2000-2100	USA, KAIJ Dallas TX	13815am	15725na		
1900-2000	USA, KTBH Salt Lk City UT	15590am				2000-2100	USA, KTBH Salt Lk City UT	15590am			
1900-2000	USA, KWHR Naalehu HI	13625au				2000-2100 s	USA, KVOH Los Angeles CA	17775am			
1900-2000	USA, Monitor Radio Intl	9385af	13770va	15665eu	17510af	2000-2100	USA, KWHR Naalehu HI	15405as			
1900-2000	USA, Voice of America	6035af	7415af	9525va	9760va	2000-2100	USA, Monitor Radio Intl	9570pa	13770eu	15665eu	
		9770va	11870va	11920af	12040af	2000-2100	USA, Voice of America	6035af	7415af	9760va	9770va
		13710af	15180va	15410af	15445af			15580af	17725af	17755af	
		15580af				2000-2100	USA, WEWN Birmingham AL	7425na	13615na	13695eu	
1900-2000	USA, WEWN Birmingham AL	11875na	13615na	15745eu		2000-2100	USA, WGTG McCaysville GA	9400am			
1900-2000	USA, WGTG McCaysville GA	9400am				2000-2100	USA, WHRI Noblesville IN	9495am			
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu			2000-2100	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WJCR Upton KY	7490na	13595na			2000-2100	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu				2000-2100	USA, WMLK Bethel PA	9465eu			
1900-2000 mtwhf	USA, WRMI/R Miami Intl	9955am				2000-2100 mtwhf	USA, WRMI/R Miami Intl	9955am			
1900-2000	USA, WRNO New Orleans LA	15420am				2000-2100	USA, WRNO New Orleans LA	15420am			
1900-2000 mtwhf	USA, WVHA Greenbush ME	9930af				2000-2100 as	USA, WVHA Greenbush ME	9930af			
1900-2000 s	USA, WVHA Greenbush ME	9930af				2000-2100	USA, WWCN Nashville TN	9475am	12160am	13845am	15685am
1900-2000	USA, WWCN Nashville TN	9475am	12160am	13845am	15685am	2000-2100	USA, WYFR Okeechobee FL	17555eu	17555eu	17750eu	17845eu
1900-2000	USA, WYFR Okeechobee FL	17555eu						21525af			
1900-1930	Vietnam, Voice of	7360na	9840eu	12030as		2000-2030	Vatican State, Vatican R	7365eu	9645eu	11625eu	
1900-2000	Zambia, Christian Voice	4965af				2000-2030	Zambia, Christian Voice	4965af			
1900-2000 vi	Zimbabwe, Zimbabwe BC	4828do				2000-2100 vi	Zimbabwe, Zimbabwe BC	4828do			
1930-1955	Austria, R Austria Intl	9655me	13730af			2005-2100	Syria, Radio Damascus	12085na	15095na		
1930-2000	Iran, VOIRI	7260af	9022eu			2007-2300 fa	New Zealand, R NZ Intl	11735pa			
1930-2000	Mongolia, R Ulan Bator	9745as	12085as			2015-2045 as	Swaziland, Trans World R	3200af			
1930-2000 vi	Papua New Guinea, NBC	4890do				2025-2045	Italy, RAI Intl	7110af	9710af	11840af	
1930-2000	Poland, Polish R Warsaw	6035eu	6095eu	7285eu		2030-2100	Armenia, Voice of	9965eu	11615eu	11665eu	
1930-2000	Sweden, Radio	6065va				2030-2100	Egypt, Radio Cairo	15375af			
1935-1955	Italy, RAI Intl	7235eu	9670eu	11905eu		2030-2100	Finland, YLE/R Finland	9855af	15440af		
1938-1955 1&3rd m	Denmark, R Denmark Intl	7520af	11860af	13805eu	15220au	2030-2035 mtwhf	Latvia, Radio	5935eu			
1945-2000	Togo, Radio	5047do				2030-2100 mwh	Moldova, R Dniester Intl	11750na			
1950-2000	Vatican State, Vatican R	4005eu	5880eu	7250eu		2030-2100	Netherlands, Radio	9860af	9895af	11655af	
1953-2000 smtwh	New Zealand, R NZ Intl	9810pa				2030-2100	Russia, Voice of Russia WS	7240eu	9665eu		
						2030-2100	Serbia, Radio Yugoslavia	7230au			
						2030-2100	Slovakia, Adv World Radio	9455af			
						2030-2100 as	Sweden, Radio	6065va	9430va	9655va	
						2030-2045	Thailand, Radio	9555eu			
						2030-2100	Vietnam, Voice of	7360as	9840eu	12020eu	
						2038-2055 1&3rd m	Denmark, R Denmark Intl	7485eu	9910au	9950eu	11620eu
						2045-2100	India, All India Radio	7410eu	11715pa		
								15225pa			
						2049-2100 smtwh	New Zealand, R NZ Intl	11735pa			

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2100-2200	Australia, Radio	6060pa 9580pa 11880pa	6080pa 9660pa 11955pa	7240pa 11660pa 13745pa	7260as 11855as
2100-2110	Bahrain, Radio	6010do			
2100-2125	Belgium, R Vlaanderen Int	5910eu			
2100-2200	Bulgaria, Radio	9700eu	11720eu		
2100-2200 vl	Canada, CBC N Quebec Svc	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, R Canada Intl	7235eu 15150eu	11690eu 15325eu	13650eu 17820eu	13670eu
2100-2200	China, China Radio Intl	5220eu	6950eu	9920eu	
2100-2130	China, China Radio Intl	3985eu	11715af	15110af	
2100-2200	Costa Rica,RF Peace Intl	6200am	15050am		
2100-2200	Cuba, Radio Havana	9550eu	13715eu		
2100-2200	Ecuador, HCJB	15540eu	21455eu		
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eqt Guinea, Radio Africa	15186af			
2100-2150	Germany, Deutsche Welle	7115as 11755af	9670as 15135af	9735af	9765as
2100-2130	Hungary, Radio Budapest	3975eu	5935eu	7250eu	9835eu
2100-2200	India, All India Radio	7410eu 11715au	9910eu 15225au	9950eu	11620au
2100-2200 vl/fas	Italy, IRRS	3980va			
2100-2200	Japan, NHK/Radio	6035as	9535as	9560as	11850pa
2100-2110	Japan, NHK/Radio	9570as	11685as		
2100-2105 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2100-2200	Lebanon, Voice of Hope	6280va			
2100-2200	Lebanon, Wings of Hope	9960va			
2100-2200	Liberia, Radio ELWA	4760do			
2100-2125	Netherlands, Radio	9860af	9895af	11655af	
2100-2200 smtwh	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4990do		
2100-2200 vl	Papua New Guinea, NBC	4890do			
2100-2156	Romania, R Romania Intl	5990eu	7105eu	7195eu	9690eu
2100-2200	Russia,Voice of Russia WS	7070eu 9665eu 11750eu	7350eu 9710eu	9480eu 9880eu	9580eu 11630eu
2100-2130	Serbia, Radio Yugoslavia	6100eu	6185eu		
2100-2200	Slovakia, Adv World Radio	6055eu			
2100-2130	Slovakia, Adv World Radio	9455af			
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2200	Spain, R Exterior Espana	11775eu			
2100-2110	Uganda, Radio	3340do	4976do		
2100-2200	Ukraine, R Ukraine Intl	5905eu 7325eu	6010eu 9560eu	6020eu 9735eu	6080eu 9875eu
2100-2200	United Kingdom, BBC WS	3255af 6005af 6195va 11750sa 15070eu	3915as 6120as 7325eu 11835va	3955eu 6180eu 9410va 11955as	5975va 6190af 9740au 12095eu
2100-2130	United Kingdom, BBC WS	9630af			
2100-2200	USA, KAIJ Dallas TX	13815am	15725am		
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200	USA, Monitor Radio Intl	13770eu	13840au	15665eu	
2100-2200	USA, Voice of America	6035af 9760va 15185va 17725af	6160va 11870va 15410af	7415af 11965va 15445af	9535va 13710af 15580af
2100-2130	USA, Voice of America	11855af	13710af		
2100-2200	USA, WEWN Birmingham AL	7425na	13615na	13695eu	
2100-2200	USA, WGTG McCaysville GA	9400am			
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRMI/R Miami Intl	9955am			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2200 mtwhf	USA, WVHA Greenbush ME	9930eu			
2100-2200 s	USA, WVHA Greenbush ME	9930af			
2100-2200	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
2100-2200	USA, WYFR Okeechobee FL	11650am 21525af	15695eu	17555eu	17845eu
2100-2200 vl	Zimbabwe, Zimbabwe BC	4828do			
2103-2110	Croatia, Croatian Radio	5895eu	7165eu		
2105-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom, BBC WS	15390am	17715am		
2130-2200	Australia, Radio	9610as 17860pa	9645as	15365pa	17795pa
2130-2200	Guam, AWR/KSDA	15310as			
2130-2200	Iran, VOIRI	6175au			
2130-2200	Russia,Voice of Russia WS	7250eu			
2130-2200	Sweden, Radio	6065va	9430va	9655va	

2130-2145	United Kingdom, BBC WS	11680sa		
2138-2155 1&3rd m	Denmark, R Denmark Int'l	7205na	9495na	9590au
2145-2200 a	Greece, Voice of	9425au		
2145-2200	United Kingdom, BBC WS	5990as	7160as	9580as

2200 UTC

2200-2300	Australia, Radio	9475as 9660pa 11880pa 15365pa	9580pa 11660pa 11955pa 17795pa	9610as 11695pa 13745pa 17860pa	9645as 11855as 13755pa
2200-2300	Canada, CBC N Quebec Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFPV Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2300	Canada, R Canada Intl	5960am	9755va	13650va	13740va
2200-2230	Canada, R Canada Intl	5960am	11705as	13670am	15305am
2200-2300	China, China Radio Intl	7170eu			
2200-2300	Costa Rica, RF Peace Intl	7385am	15050am		
2200-2300	Cuba, Radio Havana	6180na	9505na		
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eq Guinea, Radio Africa	15186af			
2200-2215	Ghana, Ghana Broadc Corp	4915do			
2200-2230	India, All India Radio	7410eu 11715au	9910eu 15225au	9950eu	11620au
2200-2230	Iran, VOIRI	6175au			
2200-2225	Italy, RAI Intl	5975as	9710as	11815as	
2200-2300	Lebanon, Voice of Hope	6280va			
2200-2300	Lebanon, Wings of Hope	9960va			
2200-2215	Liberia, Radio ELWA	4760do			
2200-2300	Malaysia, Radio	7295do			
2200-2225 mtwhf	Moldova, R Moldova Intl	7520eu			
2200-2300 smtwh	New Zealand, R NZ Intl	11735pa			
2200-2215	Nigeria, FRCN/Radio	3262do	4990do		
2200-2230 s	Norway, Radio Norway Intl	9495au			
2200-2300 vl	Palau, KHBN/Voice of Hope	9985as	11735as	13615as	
2200-2208 vl	Papua New Guinea, NBC	4890do			
2200-2300	Russia, Voice of Russia WS	7070na	7250na	9665na	11750na
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, Adv World Radio	9455af			
2200-2205	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	15600eu	17750eu		
2200-2300	Turkey, Voice of	9560va	9655va		
2200-2300	UAE, Radio Abu Dhabi	9605na	9695na	9770na	
2200-2300	United Kingdom, BBC WS	3955eu 6195va 11695au 12095eu	5905as 7110as 11750sa	5975va 9590va 11835va	6175va 9915va 11955as
2200-2230	United Kingdom, BBC WS	9410eu			
2200-2300	USA, KAIJ Dallas TX	13815am	15725am		
2200-2300	USA, KTNB Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	13770va	13840va	15405as	15665sa
2200-2300	USA, Voice of America	7215va 15290va	9705va 15305va	11760va 17735va	15185va 17820va
2200-2230 mtwhf	USA, Voice of America	6035af	7415af	12080af	13710af
2200-2300	USA, WEWB Birmingham AL	7425na	11820eu	13615na	
2200-2300	USA, WGTG McCaysville GA	9400am			
2200-2300	USA, WHRI Noblesville IN	9495am			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 mtwhf	USA, WVHA Greenbush ME	5850eu			
2200-2300 s	USA, WVHA Greenbush ME	5850eu			
2200-2300	USA, WWCR Nashville TN	7435am	9475am	12160am	13845am
2200-2245	USA, WYFR Okeechobee FL	17845af	21525eu		
2203-2210	Croatia, Croatian Radio	5985eu	7165eu	13830am	
2210-2300 vl	Papua New Guinea, NBC	9675do			
2230-2255	Austria, R Austria Intl	5945eu	6155eu	9880eu	
2230-2257	Czech Rep, Radio Prague	9430na	11600af		
2230-2300	Russia, Voice of Russia WS	7125na			
2230-2300	United Kingdom, BBC WS	7325va			
2238-2255 1&3rd m	Denmark, R Denmark Intl	9495na	11840au		
2240-2250	Greece, Voice of	9425au			
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	7155as 11660as	9705as	9950as	11620as
2245-2300	Vatican State, Vatican R	7305as	9600as	11830au	

FREQUENCIES

2300-0000	Australia, Radio	9610as	9660pa	11645as	11660pa	2300-0000	Russia, Voice of Russia WS	7070na	7125na	9665na	11750na
		11695as	11855as	13745pa	13755as	2300-0000	UAE, Radio Abu Dhabi	9605na	9695na	9770na	
		15365pa	17795pa	17860pa		2300-0000	United Kingdom, BBC WS	3955eu	5975va	6175va	6195va
2300-0000	Bulgaria, Radio	7480na	9700na					7110as	7295as	7325va	9580as
2300-0000	Canada, CBC N Quebec Svc	9625do						9590va	9915va	11750sa	11945as
2300-0000	Canada, CFCX Montreal	6005do						11955as			
2300-0000	Canada, CFRX Toronto	6070do				2300-2330	United Kingdom, BBC WS	3915as			
2300-0000	Canada, CFVP Calgary	6030do				2300-2315	United Kingdom, BBC WS	11835va			
2300-0000	Canada, CHNX Halifax	6130do				2300-0000	USA, KALJ Dallas TX	13740am	13815am		
2300-0000	Canada, CKZN St John's	6160do				2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	Canada, CKZU Vancouver	6160do				2300-0000	USA, KWHR Naalehu HI	17510as			
2300-2359	Canada, R Canada Intl	5960am	9755am	11940am	13670am	2300-0000	USA, Monitor Radio Intl	7510am	13625as	13770sa	15665eu
		15305am				2300-0000	USA, Voice of America	7215va	9705va	9770va	11760va
2300-0000	Costa Rica, Adv World R	5030am	6150am	7375am	9725am			15185va	15290va	15305va	17735va
		13750am	15460am					17820va			
2300-0000	Costa Rica, RF Peace Intl	7385am	15050am			2300-0000	USA, WEWN Birmingham AL	7425na	11820eu	13615na	
2300-0000	Egypt, Radio Cairo	9900na				2300-0000	USA, WGTG McCaysville GA	9400am			
2300-2350	Germany, Deutsche Welle	7235as	9690as	12045as		2300-0000	USA, WHRI Noblesville IN	5745am	9495am		
2300-2330	Guam, AWR/KSDA	11775as				2300-0000	USA, WJCR Upton KY	7490na	13595na		
2300-0000	Guatemala, Adv World R	11775am				2300-0000 twhf	USA, WRMI/R Miami Intl	9955am			
2300-0000	India, All India Radio	9705as	9950as	11620as	13700as	2300-0000	USA, WRNO New Orleans LA	7355am			
		15145as				2300-0000	USA, WWCR Nashville TN	5065am	7435am	9475am	13845am
2300-0000	Japan, NHK/Radio	5965eu	9535eu	9560as	11850pa	2300-0000	Vatican State, Vatican R	7305as	9600as	11830au	
2300-0000	Lebanon, Voice of Hope	6280va				2303-2310	Croatia, Croatian Radio	5895eu	7165eu		
2300-0000	Lebanon, Wings of Hope	9960va				2307-0000	New Zealand, R NZ Intl	15115pa			
2300-2315	Liberia, Radio ELWA	4760do				2310-2315	Kyrgyzstan, Kyrgyz Radio	4010eu			
2300-0000	Malaysia, Radio	7295do				2330-0000	Australia, Radio	9645as	9850as	13605as	15240pa
2300-2325	Moldova, R Moldova Intl	7520eu				2330-0000	Belarus, Radiost Belarus	7250eu	12010eu	15180eu	
2300-2306	New Zealand, R NZ Intl	11735pa				2330-0000	Belgium, R Vlaanderen Intl	11690sa	13800na		
2300-2315	Nigeria, FRCN/Radio	3326do	4990do			2330-2359	Netherlands, Radio	6020na	6165na	9845na	
2300-2350	North Korea, R Pyongyang	11700na	13650na			2330-0000	Sweden, Radio	6065sa			
2300-0000 vl	Palau, KHBN/Voice of Hope	9985as	11735as	13615as		2335-2345	Greece, Voice of	9395sa	9425sa	11595sa	
2300-0000 vl	Papua New Guinea, NBC	9675do				2338-2355 1&3rd m	Denmark, R Denmark Intl	7275va	7490va	9485va	
2300-2356	Romania, R Romania Intl	7135na	9570na	9625na	11940na	2355-0000	Japan, NHK/Radio	9570as	11685au		

SELECTED PROGRAMS

Sundays

- 2300 Costa Rica, AWR Alajuela: Wavescan. See S 1100.
 2300 Costa Rica, R Peace Intl: World of Radio. See S 0200.
 2315 Costa Rica, AWR Alajuela: The Gospel. See S 1115.
 2330 USA, WRNO, New Orleans LA: Unshackled. Radio drama from Pacific Gardens Mission.
 2340 Netherlands, Radio: Wide Angle. See S 1238.
 2348 Costa Rica, R Peace Intl: Hightower Radio. A commentary by Jim Hightower, the provocative progressive voice from Texas, on national issues.
 2353 Costa Rica, R Peace Intl: Earth and Sky. A short earth science and astronomy feature.
 2354 Netherlands, Radio: Siren Song. See S 1254.
 2355 Costa Rica, R Peace Intl: Spiritual Awakening. Readings and book reviews on a broad range of spiritually-oriented writings from around the world.

Mondays

- 2300 USA, WEWN Birmingham AL: Get a Life in Christ. Father Benedict Groeschel.
 2302 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 2310 Costa Rica, AWR Alajuela: The Amazing Facts Broadcast. Joe Crews with unusual happenings which support Christian philosophy.
 2330 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 2335 Costa Rica, AWR Alajuela: Bookmark. Joyce Gregory reads from the book in the current series.
 2338 Netherlands, Radio: Newline. See S 0038.
 2345 Costa Rica, R Peace Intl: UN Daily News. A daily news feed from the United Nations News Service reporting on UN activities around the world.
 2352 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 2352 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
 2353 Netherlands, Radio: A Good Life. See M 1253.
 2355 Costa Rica, R Peace Intl: Spiritual Awakening. See S 2355.

Tuesdays

- 2300 USA, WEWN Birmingham AL: Crisis in Culture. See S 1130.
 2300 Costa Rica, R Peace Intl: University of the Air. Self-directed and participatory learning of a variety of courses.
 2302 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 2310 Costa Rica, AWR Alajuela: The Amazing Facts Broadcast. See M 2310.
 2330 USA, WEWN Birmingham AL: Franciscan University Connection. See T 1530.
 2330 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 2330 Costa Rica, R Peace Intl: UN Perspective. A weekly program of

political, economic and social issues.

- 2335 Costa Rica, AWR Alajuela: Bookmark. See M 2335.
 2338 Netherlands, Radio: Newline. See S 0038.
 2345 Costa Rica, R Peace Intl: UN Daily News. See M 2345.
 2352 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 2352 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
 2353 Netherlands, Radio: African Season. See T 1253.
 2355 Costa Rica, R Peace Intl: Spiritual Awakening. See S 2355.

Wednesdays

- 2300 USA, WEWN Birmingham AL: Living the Word. Dominican Father Bryan Mullady on the subject of the Second Vatican Council.
 2300 Costa Rica, R Peace Intl: University of the Air. See T 2300.
 2302 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 2310 Costa Rica, AWR Alajuela: The Amazing Facts Broadcast. See M 2310.
 2330 USA, WEWN Birmingham AL: Franciscan University Connection. See T 1530.
 2330 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 2330 Costa Rica, R Peace Intl: Dialogue. A University for Peace news magazine.
 2335 Costa Rica, AWR Alajuela: Bookmark. See M 2335.
 2338 Netherlands, Radio: Newline. See S 0038.
 2345 USA, WEWN Birmingham AL: Ann Shields. See W 1545.
 2350 Costa Rica, R Peace Intl: UN Daily News. See M 2345.
 2352 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 2353 Netherlands, Radio: Sounds Interesting. See S 1153.

Thursdays

- 2300 USA, WEWN Birmingham AL: Christ the Light of the Nations. See S 1530.
 2300 Costa Rica, R Peace Intl: University of the Air. See T 2300.
 2302 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 2310 Costa Rica, AWR Alajuela: The Amazing Facts Broadcast. See M 2310.
 2330 USA, WEWN Birmingham AL: Franciscan University Connection. See T 1530.
 2330 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 2330 Costa Rica, R Peace Intl: UN Scope. See W 0245.
 2335 Costa Rica, AWR Alajuela: Bookmark. See M 2335.
 2338 Netherlands, Radio: Newline. See S 0038.
 2345 Costa Rica, R Peace Intl: UN Daily News. See M 2345.
 2352 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 2352 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.

- 2353 Netherlands, Radio: Research File. See M 1153.
 2355 Costa Rica, R Peace Intl: Spiritual Awakening. See S 2355.

Fridays

- 2300 USA, WEWN Birmingham AL: Successful Fathering in the 90's. Steve Wood, Director of Family Life Center International, hosts this new series.
 2300 Costa Rica, R Peace Intl: University of the Air. See T 2300.
 2302 Costa Rica, AWR Alajuela: Family Matters. See M 1102.
 2310 Costa Rica, AWR Alajuela: The Amazing Facts Broadcast. See M 2310.
 2330 Costa Rica, AWR Alajuela: The Christian Working Woman. See M 1132.
 2335 Costa Rica, AWR Alajuela: Bookmark. See M 2335.
 2338 Netherlands, Radio: Newline. See S 0038.
 2345 Costa Rica, R Peace Intl: UN Daily News. See M 2345.
 2352 Costa Rica, AWR Alajuela: Family Forum. See M 1153.
 2352 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
 2353 Netherlands, Radio: From Sapphire to Laser. See F 1253.
 2354 Radio Netherlands: Documentary (1). Lessons in Revolution (5th). See W 1154.
 2354 Radio Netherlands: Documentary (2). Preparing for Atlanta — Part 1 (12th). See A 2354.
 2354 Radio Netherlands: Documentary (3). Preparing for Atlanta — Part 2 (19th). See F 1454.
 2354 Radio Netherlands: Documentary (4). Living on the Land — Part 1 (26th). A three part series. Part 1 looks at farming in the west of Ireland.
 2354 Radio Netherlands: Documentary (5). Living on the Land — Part 2 (2 Jul). See H 0054.
 2355 Costa Rica, R Peace Intl: Spiritual Awakening. See S 2355.

Saturdays

- 2300 Costa Rica, AWR Alajuela: Your Story Hour. See S 0500.
 2300 Costa Rica, R Peace Intl: This Way Out. See H 0300.
 2300 USA, WRNO, New Orleans LA: The New Rock Countdown. Selections of old and new recordings and listener requests.
 2330 Costa Rica, AWR Alajuela: Voice of Prophecy. See S 0530.
 2339 Netherlands, Radio: Newline. See S 0038.
 2348 Costa Rica, R Peace Intl: Hightower Radio. See S 2348.
 2353 Costa Rica, R Peace Intl: Earth and Sky. See S 2353.
 2355 Costa Rica, R Peace Intl: Spiritual Awakening. See S 2355.

LISTENERS' NETS

You are invited to post your North American amateur radio net in this bi-monthly listing if its primary emphasis is devoted to the radio monitoring hobby.

Central Florida Listeners Group

146.730 MHz, Sun 8pm ET, Central Florida; any radio communications outside amateur bands
Net Mgr: Andy Fountain, KD4OKJ
Telephone gateways announced; CFLG BBS conference on LASER BBS 407-647-0031
Call Andy Fountain, KD4OKJ, (407)898-6784 for info

Larkfield's ARC SW-Scanner Net

147.210 MHz, Fri 9pm ET, Long Island, NYC, NJ, Conn; Shortwave BCers & utes, MW, amateur radio, scanning
Net Mgr: Hank Lukas, N2GCN
Open to all amateurs on air; by letter for scanner listeners
Contact: P.O.Box 115, Plainview, NY 11803-0115

Listening Post

147.03, 224.96, 447.725 (W3DID/R), Sun 8pm, Baltimore and metro area; non-amateur transmissions DC to Daylight except ECPA-related items or tacticals
Net Mgr: Mike Agner KA3JJZ
Open to all amateurs on air; by maildrop at: 6710-F Ritchie Hwy #236, Glen Burnie, MD 21060; or email: ka3jjz@erols.com (home) or rsfbmja@mail.opm.gov (work)

Montreal DX Listeners Net

146.910 MHz, Sun 8:15 pm ET, Montreal PQ area; MW SW, & Scanner
Net Mgr: Sheldon Harvey VE2SHW
Telephone gateways announced

Monitoring the Long Island Sounds Net

146.805 Tues 8pm ET, Long Island, NY; Primarily scanning
Net Mgr: WB2RVA, 2134 Decker Ave, North Merrick, NY 11566

Monix SW and Scanner Listeners Info Net

146.835 MHz, Thurs. 9:30 pm ET; Cincinnati/Tri-State Area; All band
Net Mgr: Mark Meece, N8ICW, (513) 777-2909 (no collect calls)
Open to all amateurs; Telephone gateways to net mgr up to 1/2 hr before net; The Listening Post BBS (513) 474-3719

New York DX Association

145.190 (PL 141.3) Wed 8pm ET, Montclair, NJ/NYC area; "DC to Light"
Net Mgr: Charles Hargrove N2NOV, 723 Port Richmond Avenue, Staten Island, NY 10302-1736. Meet World Financial Center last Sundays @ 4pm

Gateways: telephone (212) 978-3375 up to 1/2 before net. email: n2nov@planet.earthcom.net. TCP/IP: n2nov@n2nov.ampr.org. BBS/packet 145.630 MHz or 718-876-7928 24hrs. Hams use callsign as username, others use 1st initial and lastname.

News Monitor Scanner and SWL Listeners Net

462.725 GMRS 24 hrs/day, Greater Cincinnati, OH, area; All bands scanner and SW
Net Mgr: Bryan Hoffman, Unit 601 (KAE9858)
24 hr telephone gateway (513) 269-6720
Mail drop: News Monitor, P.O. Box 18072, Greenhills, OH 45218
Closed repeater. Must have permission from rpt owner or net mgr first. Must be licensed GMRS user for this frequency.

Northeast SW Listeners and Scanners Net; Rip Van Winkle Society

147.21 MHz (WB2UEB) Wed 8pm, Albany, NY, area.
Net Mgr: Ray Loeper N2RAD

Ontario DX Association - Listeners Net

442.375 (VA3ODX; 103.4Hz CTCSS tone), Sun 8:30pm ET; Toronto area coverage; LW, MW, SW, FM, VHF/UHF topics discussed
Net Mgr: Stephen Canney, VA3ID
Open to all; repeater used daily by ODXA members

Rocky Mountain Monitoring Net

147.225, 224.980 Denver; 145.460 Boulder; 145.160 Colorado Springs Sun 20:00; communications monitoring
Brian Gould, KB0MEP, Mt. News Net

Shortwave Listeners Net, Association of North American Radio Clubs

7.240 MHz LSB, Sun 10am ET, Eastern US moveS to 3.940 MHz after the 40m session closes for an informal session. Shortwave broadcasts and utilities, medium wave, longwave. Net info: http://www.trsc.com/swl_nete.htm
Net Mgr: Tom Sundstrom, W2XQ, PO Box 2275, Vincentown, NJ 08088-2275
Telephone gateways announced. Contributions accepted via the Internet Relay Chat (IRC) channel #swl while the net is in progress.

Southern Wisconsin SW Listeners Net; MARA

147.150 MHz, alt 146.760 MHz. Madison, WI, area
First Sun 8pm CT. Shortwave, scanning, dc to daylight, equipment notes and comments.
Net Mgrs: N9LTD, KA9SRU, N9EWO
Contact: N9EWO, Dave Zantow, 1609 Ontario Drive, Janesville, WI 53545

All Ohio Scanner Club: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036. U.S. northeast of the Mississippi: VHF/UHF/HF utilities. Net Mon 9:30pm 146.940. *American Scannergram*. \$18 U.S. \$21 Can/Mex, \$28 ww. \$3 sample. Annual summer meeting.

American SW Listener's Club: Stewart MacKenzie, WDX6AA, 16182 Ballard Lane, Huntington Beach, CA 92649, (714) 846-1685; wdx6aa@aol.com. Western US, Pacific, Asia. SWBC, utilities, longwave, clandestine. SWL \$24 US, \$25 Can/Mex. \$2 sample (\$3 ww). Meets 1st Sats 10am address above.

Association of Clandestine Enthusiasts

(A.C.E.): Kirk Baxter, P.O. Box 11201, Shawnee Mission, KS 66207. US, Europe and Middle East; Pirate and clandestine. *The A.C.E.* \$20 US, US\$21 Can/Mex, US\$27 ww.

Association of Manitoba DX'ers (AMANDX):

Shawn Axelrod, 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada, (204) 253-8644. Manitoba: LW, MW, SW, and VHF/UHF. Meets monthly. \$2.

Bay Area Scanner Enthusiasts: Bruce Ames, P.A.O., 105 Serra Way #363, Milpitas, CA 95035, (408)267-3244. Western U.S.; 25+ MHz. *Listening Post* (bi-monthly). Meets 2nd Mons. 7:30 Milpitas Police Admin Bldg. \$25 US, \$2 sample, or SASE for info.

Bayonne Emergency Radio Network (BERN): Ray Baron/Bob Frasca, P.O. Box 1203, Bayonne, NJ 07002-6203, 1-800-286-2876. Metro NJ, NY; Fire/disaster, pub safety.

Boston Area DXers: Paul Graveline, 9 Stirling St., Andover, MA 01810-1408, (508)470-1971, 50 mile radius Boston; 3-30 MHz. Meets 3rd Fris 7:30pm, The Lexington Club. Rte 4/225 1/4 mi W of Rte 128.

Canadian Int'l DX Club: Sheldon Harvey, 79 Kipps St., Greenfield Park, Quebec, Canada J4V 3B1, (514)462-1459. Canada nationwide/membership open to all; General coverage. *The Messenger*. \$26 Can, \$25 US, \$US28 or \$Can35 ww. \$2 sample. Meets 2nd Tues 7pm Montreal; several annual events.

Capitol Hill Monitors: Alan Henney, 6912 Prince Georges Ave, Takoma Park, MD 20912-5414, (301) 270-2531/5774 fax. DC, MD, No.VA, So.DE. Scanner bands. Frequency Forum BBS 703-207-9622 (8-N-1) *Capitol Hill Monitor*. \$10. Meets irregularly.

Central Florida Listeners Group: Andy Fountain KD4OKJ, (407)898-6784. Central Florida; All bands. Net on 146.73 MHz Sun 8 pm. Meets 2nd Sats 12 noon. Conf#10 on Laser BBS (407)647-0031.

Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

Central VA Radio Enthusiasts: Richard Rowland, POB 34832, Richmond, VA 23234-0832.

Metro Richmond and vicinity. VHF/UHF. SASE. No newsletter, no dues. Meets quarterly in Richmond.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 300 mile radius of Chicago; DXing all bands. *DX Chicago*. \$17, \$1 sample. Meets irregularly.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6219 N. Greenview, Chicago, IL 60660-1815. Chicago & midwest. Public safety & general coverage.

SCUG/CARMA BBS (708)852-1292. *CARMA Newsletter*. Meetings (Sats) and newsletter bi-monthly on alternate months.

Colorado Shortwave Listeners Club: Rob Harrington N0NNI, P.O. Box 370593, Denver, CO 80237-0593, 303-756-9455. Colorado residents. Longwave, shortwave. 35 cents plus SASE for info or Internet YABX92A@prodigy.com.

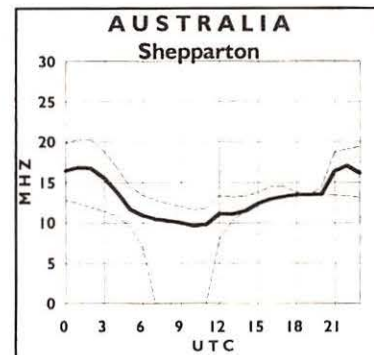
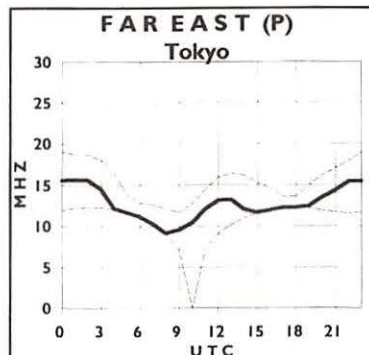
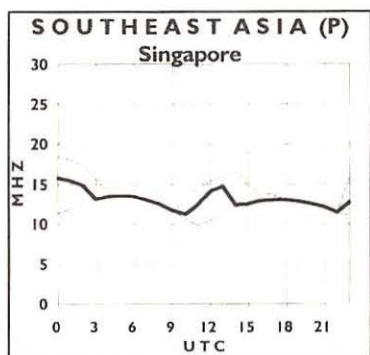
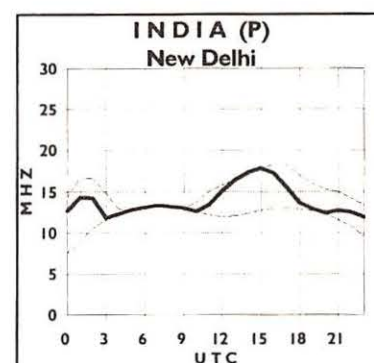
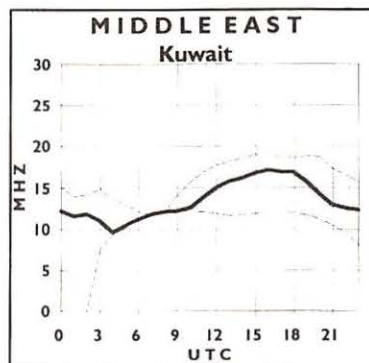
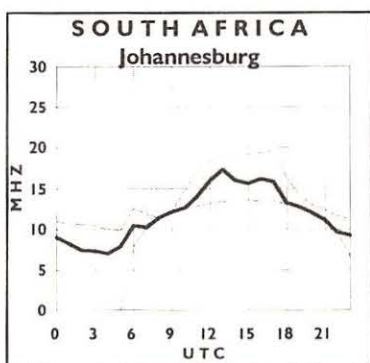
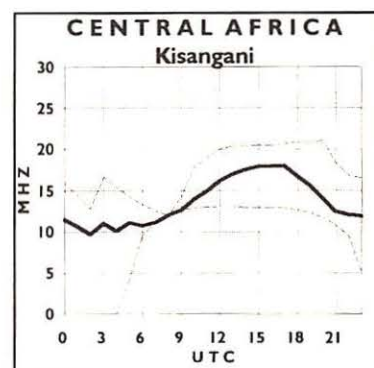
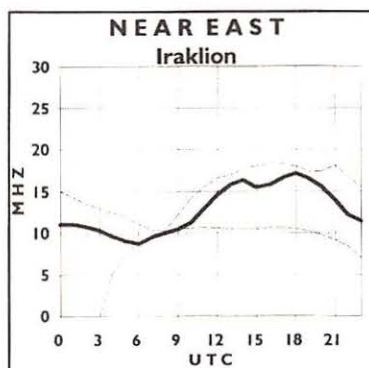
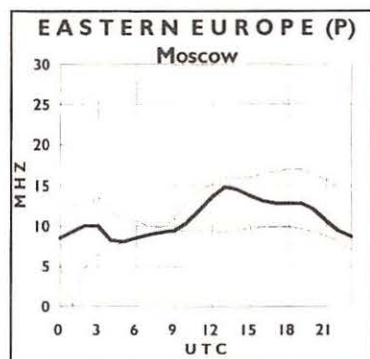
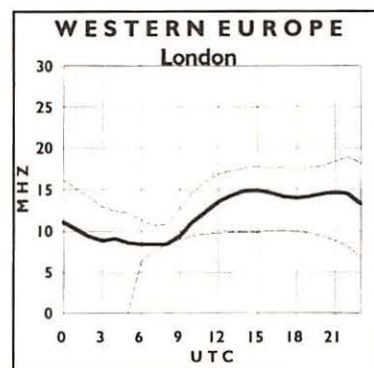
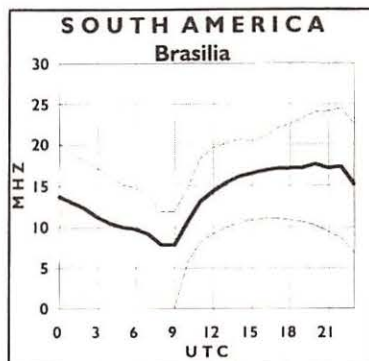
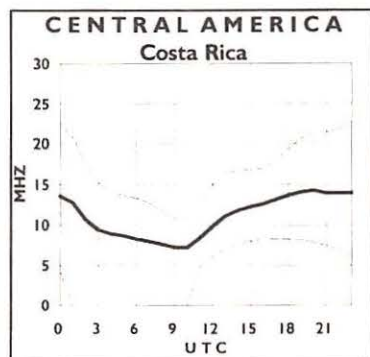
Communications Research Group: Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

The well-equipped monitoring post of Ron Bruckman, editor of "Radio Monitors Newsletter of Maryland."



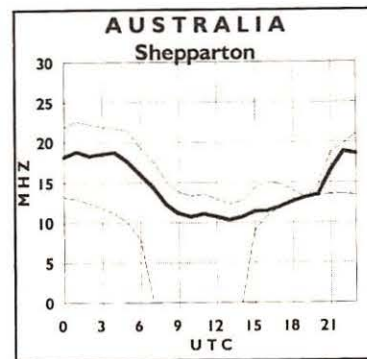
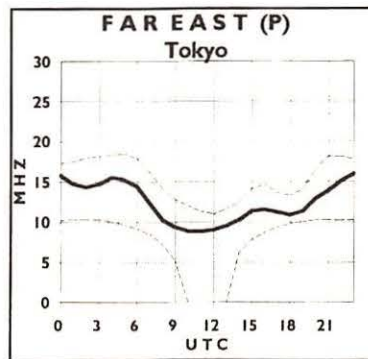
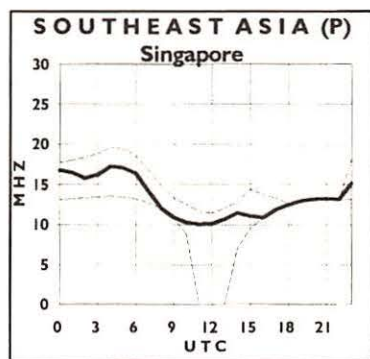
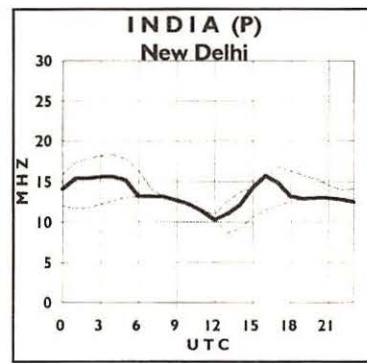
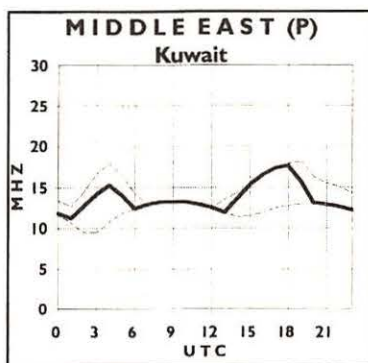
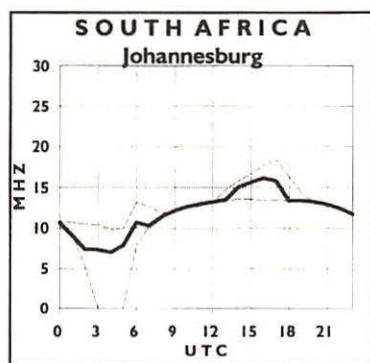
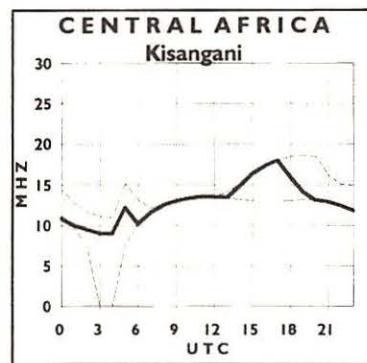
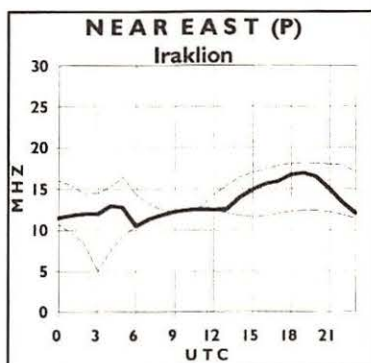
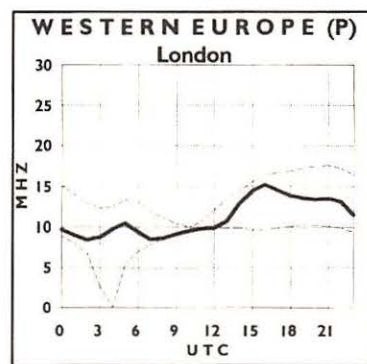
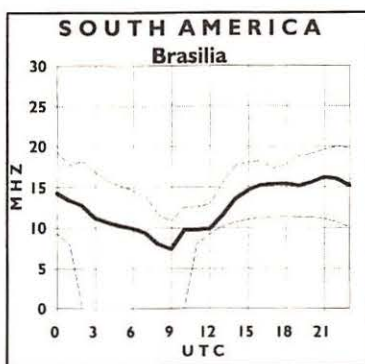
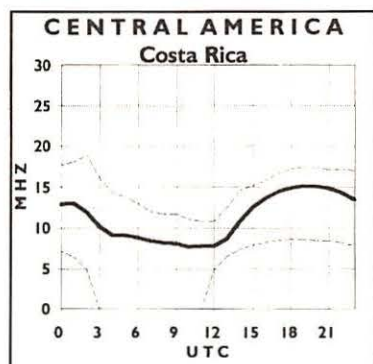
Propagation Conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear. The Sun Spot Number used this month for forecasting purposes is 6.



Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.



Top End Tour

Hank Holbrook (MD) received this QSL from marine station EAS in Spain. It is the first transatlantic catch on 500 kHz that I am aware of.

How did you discover the longwaves? For me, it was while tuning across the low end of the AM band late one night. Beacon HEH/524 kHz (Newark, OH) was coming through loud and clear. "What's this?" I thought. "Morse Code on the AM band?" My curiosity took over, and within a few days I had constructed a simple LF converter that allowed me to tune far below the end-stop of my radio's dial.

I've been hooked on the low band ever since, but I've always held a special fondness for that "in-between" range of 500 to 535 kHz—the focus of this month's column.

What Can You Hear?

At 500 kHz, you can hear a fair amount of CW maritime traffic as this is an international distress and calling frequency. The number of ships using it are dwindling, however, and the US Coast Guard has discontinued its 500 kHz watch altogether. Catch these stations while you can.

Starting at about 510 kHz, you will begin to hear beacons. The *Aero/Marine Beacon Guide* shows HES/511 kHz as the first US

beacon operating above 500 kHz. After that there are about 85 additional entries, plus a number of military allocations. Compared to the more traditional beacon frequencies, this is a lightly loaded band. For that reason it is often possible to catch stations hundreds of miles away without the usual congestion and "dueling" that occurs below 500 kHz.

The amount of action you'll hear depends, in part, on the AM band operation in your area. For example, in Toronto, Ontario, there is a powerful AM station operating on 530 kHz. A listener near Toronto would have difficulty hearing any but the strongest beacon signals above, say, 525 kHz. With a directional antenna, however, this problem could be minimized.

A relative newcomer to the top end is NAVTEX, a 518 kHz teleprinter service for mariners. This service is available in the US, Canada and many other countries around the world. NAVTEX carries marine safety and navigation information as well as bulletins on missing vessels. If you live near coastal waters, you should have no trouble picking up one or more of the NAVTEX stations.

You can decode NAVTEX with a ham/SWL demodulator by selecting Mode B AMTOR (or SITOR) and tuning carefully for the data signal. This can provide for some interesting monitoring and is a nice change of pace from beacon hunting.

Our final stop is at 530 kHz where you might be able to catch one of the Traveler's Information Service (TIS) stations. Despite their low power, it is sometimes possible to hear TIS stations a few hundred miles away. If you hear a weak signal at 530 kHz that you can't identify, it's likely to be a TIS.

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Estacion E.A.S. Localidad (SPAIN)

Frequency 500 KHZ Power 200 W.
Frecuencia 500 KHZ Potencia 200 W.

Date NOVEMBER 3, 1995 Time 0601 UTC GMT
Fecha NOVEMBER 3, 1995 Hora 0601 UTC GMT

Signature [Signature]
Firma Fdo.: Graciano García Sánchez

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LF in the News

In the days following the Balkan air tragedy that claimed the lives of Commerce Secretary Ron Brown and several US business leaders, many newspapers carried stories about what might have gone wrong on that flight. One headline catching my attention read "Plane Used 1930's Technology to Land." You guessed it—the story concerned beacons.

In my opinion, the story placed unfair blame on the beacon system being used. LF Beacons were not intended to provide altitude data or warn the pilot about obstructions ahead. They were intended to provide a simple means of azimuth direction finding that would assist a pilot in reaching his destination.

It may be true that the flight area lacked adequate navigation services, but it serves no purpose to blame a tool that worked exactly as it was designed. Beacons have helped countless pilots return home safely and continue to be an important back-up tool for the modern pilot. They have been with us a long time, but I view that as a testimony to their usefulness and simplicity.

LOGGINGS

In keeping with our top-end theme, all of the loggings this month are at or above 500 kHz. There are also quite a few non-beacon entries in the list. Be sure to give these stations a try. The dial spinners this month are: Perry Crabil (VA), Mike Csontos (NY), Hank Holbrook (MD) and Don Tomkinson (CA).

FREQ.	ID	Location	By
500	EAS*	Asturias, Spain	H.H. (MD)
500	HPP*	Balboa, Panama	H.H. (MD)
500	HZLL*	New York, NY	H.H. (MD)
500	WPGJ*	Jacksonville, FL	H.H. (MD)
500	WSKH*	34-57N 75-30W	H.H. (MD)
510	??	Unknown,	
		Spanish voice	M.C. (NY)
512	HMY	Lexington, OK	P.C. (VA)
513	PP	Omaha, NE	P.C. (VA)
515	ONH	Jefferson City, MO	P.C. (VA)
515	OS	Columbus, OH	P.C. (VA)
516	YWA	Petawawa, ONT	P.C. (VA)
518	GCT	Guthrie Center, IA	P.C. (VA)
521	GM	Greenville, SC	P.C. (VA)
521	INE	Missoula, MT	D.T. (CA)
521	TVX	Greencastle, SC	M.C. (NY)
523	JJH	Johnstown, NY	M.C. (NY)
524	HEH	Newark, OH	M.C. (NY)
526	RWE	Camp Roberts, CA	D.T. (CA)
526	ZLS	Stella Maris, BAH	P.C. (VA)

* Maritime CW station

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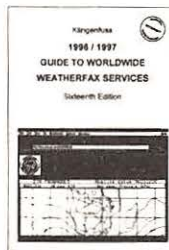
Fed up with boring lists of strange expressions such as <http://www.arrghhhhh/>? Our alternative is concrete information in black and white! The result of hundreds of hours of work, thousands of sheets of paper and an astronomical phone bill, our new INTERNET RADIO GUIDE shows you the varied features of the Internet for radio amateurs and worldwide listeners. Now you can see what the so-called cyberspace really has in store for you!

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A Station of My Own

In the broadcasters' section of Compuserve, one question keeps popping up: How do I start a radio station? I don't think I've ever met a domestic-band DXer who hasn't asked the same question. It seems simple. In most parts of the country, there are obvious gaps in both the AM and FM dials; one should certainly be able to get an FCC license for a low-powered station in one of those gaps. Unfortunately (for the would-be broadcaster), or fortunately (for the DXer who already has too many locals!), the process isn't that easy.

When applying for a broadcast station, the first thing you'll need is money—lots of money. As the FCC says on their own Internet page (www.fcc.gov/mmb/asd/getstat.html), almost every applicant uses the services of consulting engineers and lawyers. As an engineer myself, I can tell you we aren't cheap—and we all know about lawyers!

Whether you proceed on your own or with professional help, the next step is to find a frequency. On AM, you may choose any frequency that doesn't interfere with existing stations. In most cases, you'll need to design a directional antenna to prevent interference. The minimum power limit is 250 watts; don't even bother applying for a 10-watt AM station.

FM and TV stations are only allowed on allotted frequencies. A table of allotted frequencies appears in the FCC regulations; if your town appears in this table, you may apply for any unused frequency shown. In a few cases, frequencies have been open for many years, and the first application filed will be granted, assuming there are no serious defects. In other cases, a "filing window"—a period of time for accepting applications—exists. All applications filed within this window will be considered for that frequency.

But, in most cases, all allotted frequencies are in use. Does this mean you're out of luck? Not necessarily. The table in the FCC regulations doesn't claim to contain all possible allotments. FCC regulations also include a list of required distance separations between stations. If you can find a frequency that can be allotted to your town without causing interfer-



WMJQ and WCMF were Rochester, NY's rock stations in the early 1980s.

ence, you can file a Petition for Rulemaking. If the FCC's engineers agree, they'll add your frequency to the table. Unfortunately, this does *not* mean you'll automatically get the license! Others may also apply for this frequency, and your request will be considered on an equal basis.

Once you have found a frequency, you need a copy of FCC Form 301, Application for Construction Permit for Commercial Broadcast Station. This form makes the IRS's Form 1040 look like child's play... Questions on the form gather information on the location of the proposed towers, the amount of power to be used, and the type of antenna. They also ask non-technical questions to ensure the applicant is qualified to own a broadcast station—that they haven't been convicted of a felony, that they have enough money to build and operate the station, and that they're a U.S. citizen. Three copies of the form, and a non-refundable filing fee of several thousand dollars, must be sent to the Pittsburgh bank that handles fee collection. If the fee is in order, the application is forwarded to the Commission in Washington.

Assuming you've made it this far, the FCC's engineering staff checks your application for defects. (Did you specify the right frequency? Do the tower coordinates make sense?) You're given one opportunity to correct any errors found in the application; if there are still errors, the application is returned. If it's accepted

for filing, your name and address appear in a Public Notice. Others have 30 days to oppose your application or file a Petition to Deny.

Should there be more than one applicant for "your" frequency, or if someone opposes your application, the FCC may designate it for hearing. A judge is assigned, and you have 20 days to file a "Notice of Appearance."

You also have 30 days to make minor amendments to the application. After the hearing, the judge decides which application should be granted. Decisions may be appealed to the Commissioners themselves, and then to the federal courts.


If you're *really* lucky, yours will either be the only application, or the judge will find yours to be the best, and will grant it. Now (assuming the other applicants don't appeal...) the FCC issues a "Construction Permit," often referred to as a CP. For radio, this is good for 18 months; 24 months for TV. You may also request a callsign at this time—if you don't, the FCC will assign one at random. The CP is a kind of guarantee that if you build the station according to your application, it will receive a license when you're done. It also conveys permission to test the transmitter on the air.

Finally, once you've built and tested everything, you can begin broadcasting. Within 10 days, you must file Form 302, "Application for New Broadcast Station License." This application is almost always granted. Once granted, you have a seven-year license (for radio: five years for TV) to broadcast. These terms will probably lengthen as a result of the Telecom Act.

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■ Other ways of getting on the air

If the extensive process described above doesn't talk you out of applying for a broadcast license, the high filing fees and the high cost of accepted equipment will. But there are other ways to have your own station.

G.R. Gaule in Oregon operates KBN, 680 kHz in Lebanon. KBN uses a 5 watt transmitter, but requires no license. Instead of broadcasting through the air, it uses the local power lines to carry its signal! Such "carrier current" stations were popular on college campuses for many years, but I don't hear much about them today.

These stations rely on Part 15 of the FCC regulations, which allow incidental radiation for a specific distance from the nearest part of the "circuit." The transmitter is coupled to the AC wiring, and that wiring becomes the "circuit." By placing your radio close enough to an outlet, you pick up enough of this incidental signal.

KBN-680 covers about a square-mile section of central Lebanon. The non-commercial station's programming includes traditional country music, news, and talk. Should you hear it (unlikely, unless you live in Leba-

non) the mailing address is Box 2008, Lebanon, OR, 97355.

Those not technically inclined should be very careful about trying carrier-current communications. Of course, it's very dangerous for amateurs to connect equipment to the power lines. It's also easy to violate Part 15 and interfere with other stations.

■ Expanded-band notes

KXBT's operation on 1640 has moved to conform with the recently-released expanded-band table. Several DXers now report the station operating on 1630.

Joe Kurtz of suburban Minneapolis heard KXBT early on the morning of April 17 abruptly going off the air at 0853 UTC. Conditions were poor, so Joe didn't get the station's location. Of course, we now know what KXBT is. But this situation provides a good reason to plug the specialty club(s) for domestic-band DXers. Consider the National Radio Club and/or International Radio Club of America for AM; the WorldWide TV-FM DX Association for FM and TV. Addresses appear in "Club Circuit," or check www.anarc.org on the Internet.

Classic Soul KXBT (AM) Jams on Expanded Band

by Alan Peterson

SAN FRANCISCO A new voice arrived on the expanded AM band Tuesday, March 19, at 7 a.m., PST.

KXBT(AM) in Vallejo, Calif., became only the second radio station to inaugurate regular broadcasts in the new expanded band, and did so with a star-studded celebrity on-air party.

"We like to call ourselves 'The first expanded-band station west of New Jersey,'" said KXBT engineer Alan McCarthy. The station simulcasts a soul oldies format on both 1190 kHz and 1640 kHz, but will soon move down to 1630 KHz.

The talent lineup at the kickoff celebration was every bit as exciting as the event itself: Appearances by James Brown, Barry White, Martha Reeves and Johnny "Guitar" Watson helped welcome KXBT to the air. Brown put his personal stamp of approval on the new signal with a rousing "It feels good!"

Andy Santamaria is the general manager of KXBT, and one of the partners. He has owned the station for about three years.

"We knew that the expanded band was coming," said Santamaria. "We knew the FCC would do all it could to make KXBT a full-time station." Santamaria credited FCC engineer Bill Ball with assistance in getting up and running in the expanded band.

"He was very helpful in getting through

the maze," said Santamaria. "It was my first time having to get something complicated through the commission and I was pleasantly surprised. I got the impression that the FCC is trying hard to honor the congressional mandate of the four AM daytimers that have priority."

The congressional mandate directed any
continued on page 3

*Clipping from Radio
World via Kevin J.
Klein describes
KXBT's expanded
band programming..*

■ Bits and Pieces

• New York City lost its country-music station when WYNY-103.5 became rock station WKTU. But Long Island listeners now have a new outlet for the Nashville sound. WLIE-102.5 Bridgehampton began broadcasts in early April and IDs as "East End Country." The station shares WBAZ-101.7's offices.

• Thanks to Michael Csonotos of Lima, New York, for bringing some historical perspective to the column this month with the WMJQ, WCMF, and WRKO logos.

WCMF-96.5 is still a rock station in Rochester, but WMJQ (92.5) is now country music station WBEE-FM. The WMJQ calls are now on 102.5 MHz in nearby Buffalo.

• Both Boston stations got in trouble with the FCC in the early 1980s over questionable billing practices. The AM station is now WRKO, and the TV station is WHDH-TV. Ironically, the WHDH-TV calls were previously used on channel 5 in Boston — until that station lost its license in another incident in the early 1970s! The WNAC calls now reside on channel 64 in Providence, Rhode Island.

• Propagation conditions have been poor for much of the spring. They've recovered nicely; there should be plenty of DX out there. Catch your share, then let us know! Write P.O. Box 98, Brasstown NC 28901, or via the Internet to 72777.3143@compuserve.com

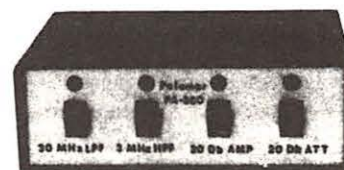
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Governments Close Community Radio Stations

Shortwave pirate radio, micropowered FM broadcasters, and other unlicensed stations are a worldwide phenomenon. North American DXers usually hear shortwave transmitters from our continent, but an international Community Radio movement is increasingly in the news. Veteran DXer Don Moore of Davenport, Iowa, sends in several examples of recent conflicts.

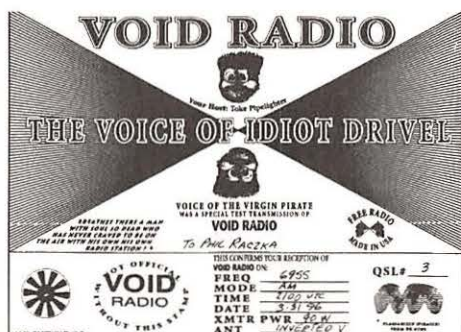
Spanish government authorities recently closed down Contrabanda FM, which had operated with a 24 hour schedule on 91.0 MHz in Barcelona. Radio TSF Cote d'Azur was closed down in Grasse, France, by the French Conseil Supérieur de l'Audiovisuel, an FCC equivalent. A bill is pending in the Brazilian legislature that would regulate Brazil's "Free Radio Stations" that operate throughout the country. Pirate and community radio stations are seldom popular with the government, regardless of their location.

Don finds continually updated news about international Community Radio on the AMARC internet web page. You can e-mail them via bgirard@pulsar.org.ec or head to their <http://www.web.apc.org/amarc/pulsar.html> web site.

Radio FEUU has been a more successful operation in Montevideo, Uruguay. The 103.5 MHz FM outlet is the voice of the Federación de Estudiantes Universitarios del Uruguay. This "rebel radio" group advocates a budget increase for university education in the country. Uruguay authorities had previously busted a similar station, "El Puente." MT thanks Horacio A. Nigro of Uruguay and Tikayuki Inoue Nozaki of Japan via Don Moore for this item.

■ Clandestine Internet URL's

Pete Costello suggests that DXers looking for semi-clandestine material on the internet should check the Radio Resistor's Bulletin site, using <http://kiwi.futuris.net/rw/featurerrb.html> as an address. Veteran Cleveland radio broadcaster Joel Rose says that he's had occasional trouble accessing Harald Kuhl's fine clandestine station schedule list from Germany. Fortunately, the Free Radio Network posts Harald's list among an extensive list of internet links to clandestine material. As we've pointed out before, <http://www.clandjop.com/~jeruzan/frn.html> takes you to this excellent site, frequently



updated by John Cruzan and Kirk Trummel.

Lee Silvi of Mentor, Ohio, sends in a *real* shortwave log of La Voz del CID, the anti-Castro clandestine on 9941 kHz. He heard it at 0400 UTC through Cuban jamming.

If you have a strong stomach, Rich and Talea Jurens of Katy, Texas, point out that a large collection of pictures from the 1996 Winter SWL Festival in Kulpville, Pennsylvania, has been posted: http://www.crosslink.net/~mfine/swl_fest2.html takes you to the pirate radio pictures.

■ Pirate Radio Directory

A few readers have inquired about the 1996 edition of *The Pirate Radio Directory* by Andrew Yoder and George Zeller. The eighth annual guide to pirate activity includes station profiles, a broadcast guide to times and frequencies used, plus an index of stations who were inactive in 1995 but might return in the future. Copies are available for \$12.95 plus \$2.00 shipping from the publisher, Tiare Publications, PO Box 493, Lake Geneva, WI 53147. Several other *Monitoring Times* advertisers carry the book.

■ K-2000 a Big Winner

Last month we pointed out that **K-2000** was the winner of the best overall station award in the annual Pirate Popularity Poll conducted by *The ACE*. This elaborate, hilarious parody of DXers and DXing has to be one of the most interesting stations on shortwave today, licensed or unlicensed. The Warden of pirate station **Cell Block 13** writes in to announce the results of his station's pirate poll, which also awarded the big prize to **K-2000**. **WREC** ranked high in both polls, with the **Voice of the Rock** getting honorable mention by both pollsters for their marathon broadcast

from an island near Boston using a 10 watt battery powered Radio Animal "Grenade" transmitter.

■ What We Are Hearing

The huge volume of pirate activity reported this month is record breaking! We have loggings of nearly four dozen different shortwave pirate broadcasters. All frequencies are in kHz, with times in UTC.

Pirate stations welcome correspondence to the following addresses: PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 28413, Providence, RI 02908; PO Box 146, Stoneham, MA 02180; PO Box 605, Huntsville, Alabama 35804; PO Box 17534, Atlanta, Georgia 30316; PO Box 25302, Pittsburgh, PA 15242; Boite Postale 130, Rueil, Cedex, France; and Postfach 220342, D-42373 Wuppertal, Germany. For return postage, enclose three 32¢ stamps in the envelope to USA addresses. \$2 US or two International Reply Coupons go to foreign maildrops.

Altered States Radio- 6955 at 0015. William Hurt's most recent production combined parody ads with music that had been taped by a shortwave DXer. His QSL's picture dead rock stars. Addr: Merlin. (Jerry Coatsworth, Merlin, Ontario; Dick Pearce, Brattleboro, VT)

Cell Block 13- 6955 at 0300. When he wasn't conducting pirate polls, Warden Cleaver broadcast a fearful show for late income tax filers. Addr: Stoneham. (Jesse Rose, Hampton, VA)

Defiance! 90- 6956 at 0100. This 1989 leftist pirate reactivated unexpectedly with its critical commentary on politics. Addr: Blue Ridge Summit. (Andrew Yoder, Blue Ridge Summit, PA; Neil Wolfish, Toronto, Ontario; Rose)

Free Hope Experience- 6954 at 1930. Major Spook programs rock or novelty music, spiced by discussions of offbeat subjects such as aliens and UFO's. Addr: Blue Ridge Summit. (Jack McMahon, Depew, NY; Dennis Myhand, Mercedes, TX; James Oakley, Oceanside, CA; Barry Williams, Enterprise, AL; Pat Murphy, Chesapeake, VA; William Hassig, Mt. Prospect, IL; John Mello, North Scituate, RI; Jurens; Pearce; Coatsworth; Silvi)

Friday Radio- 6955 at 0000. Guess which day of the week they use for broadcasting? If you need more than one guess, maybe it's time for a nap. Addr: Providence. (Robert Ross, London, Ontario; Pearce; Yoder)

Jerry Rigged Radio- 6955 at 1500. QSL's arriving from this new one are entirely written in the semaphore alphabet, which is the code used to send messages by flags. A deciphering code is included. Addr: Providence. (Murphy; Wolfish; direct from the station)

Jolly Roger International- 6955 at 2200. This one really sounds like a pirate. The announcer's gruff

voice stands out in a fast paced production of rock, jingles, and comedy. Addr: Wellsville. (Wolfish)

KAOS Radio- 6955 at 0000. Their new QSL picture Maxwell Smart from the old *Get Smart* TV show. To QSL stations like this that have no address, you have to send in loggings to either *The ACE* or the *Pirate Pages* bulletins. Addr: None. (Bill McClintok, Minneapolis, MN; Mike Prindle, New Suffolk, NY; Randy Ruger, North Hollywood, CA; Williams; Wolfish; Jurens; Myhand; Coatsworth; Murphy; Silvi; Rose; Hassig)

KDED- You can still submit a brief taped segment for their forthcoming "Open Microphone Show" that will showcase musings from listeners. Addr: Providence. (Ike Kelly, Houston, TX; Hassig; Myhand; Jurens; Wolfish; Williams; Yoder; Rose; Pearce; direct from the station)

KGDR- 6955 at 2345. Grateful Dead Radio has joined KDED as a tribute station to Jerry Garcia's music. Addr: Providence. (Kevin Nauta, Grand Rapids, MI; Ross; Hassig; Wolfish; Silvi; Coatsworth; Murphy)

KQSB- 6957 at 1545. This one hadn't been heard since the mid-1980's, but it resurfaced with a replay of a decade old production. The announced Arcata, California, maildrop has long been defunct. Addr: Try Wellsville. (Wolfish)

Montana Audio Relay Service- 6955 at 0045. With the Freeman and the Unabomber in the news, it was inevitable that a pirate would pick up on the Montana theme. This new one plugs the state as the home of strange groups. Their signal got all the way to Europe! Addr: Merlin. (Garie Halstead, St. Albans, WV; Ranier Brandt, Germany)

Mystery Radio- 6955 at 0430. Pink Floyd rock and new age instrumental music are staples on this station. Addr: Stoneham. (Wolfish)

N2YCM- 6955 at 0530. Obviously using a stolen ham radio callsign, their rock programs use a "Yankee Clear Mommy" slogan. Addr: None. (Jurens)

Omega Radio- 6950 at 2145. Dick Tator plays heavy metal music, often from Christian rock bands. Addr: Blue Ridge Summit. (Mello; Pearce; Murphy; Hassig)

Outlaw Radio- 6955 at 0315. Their sirens interval signal and female announcer make this one relatively easy to identify. Suggestive remarks are mixed in with rock music. Addr: Providence. (Prindle; Wolfish; Williams; Rose; Jurens; Silvi; Hassig; Mello)

Primitive Radio- 6955 at 1415. Like many pirates, Holden Caulfield plays rock tunes on his station. But, his narrative poetry is unusual on the shortwave bands. Addr: Wellsville. (Yoder; Wolfish; Coatsworth; Jurens; Williams; Pearce; Hassig; Rose)

Radio Angeline- 6955 at 0130. Jo Jo Katew's memorial to his true love Angeline is a classic pirate station from the 1980's. Their interval signal is "Send in the Clowns" on a music box. Somebody has been dusting off these old shows lately. Addr: Old Washington drop is defunct. (Yoder; Rose; Wolfish)

Radio Dead Man- 6955 at 1930. A strange mix of industrial and electronic music, Tree Frog Beer ads, and other odd material is heard on this veteran pirate. Addr: Announced address defunct. (Wolfish)

Radio Free Speech- 6955 at 2130. Given their relatively frequent broadcast schedule, most pirate DXers have heard Bill O. Rights, editorial director Earl Pitts, and the parody sketches that are on RFS. Addr: Wellsville. (Nauta; Hassig; Silvi; Coatsworth; Wolfish; Murphy; Yoder; Prindle; Jurens; Mello; Pearce)

Radio Fusion Radio- 6955 at 1645. A handful of pirate stations program rap music; this is one of them. Look for a synthesized female voice who gives their address. Addr: Providence. (Wolfish; Coatsworth; Silvi)

Radio Garbanzo- 6955 at 0330. Fearless Fred and his sidekick Harry put together a fast paced blend of rock music and comedy. These shows are always a treat. Addr: Wellsville. (Rose; Wolfish; Yoder)



Radio Marabu- 6955 at 0000. This German Europirate, which usually transmits rock music shows, uses North American transmitter relays and addresses. Addr: Wellsville or Merlin. (Hassig; Yoder; Wolfish; Pearce)

Radio One- 6950 at 0030. Bobaloo's rock oldies shows are slick professional productions that rival similar efforts on commercial radio. Addr: Wellsville. (Kelly; Yoder; Rose; Jurens; Silvi; Williams)

Radio Titanic International- 6955 at 0000. Of all the European pirates who have relay relationships with North American transmitters, this rock music outlet probably is the most frequently heard. Addr: Wuppertal. (Murphy; McMahon; Coatsworth; Hassig; Ross; Silvi)

Radio Two- 6950 at 0145. Like Avis vs. Hertz, Radio Two has been stimulated by Radio One. The rock oldies on #2 are much older, dating back to 1957. Addr: Providence. (Wolfish; Yoder; Rose; Pearce)

Radio USA- 6955 at 0115. Having survived an FCC bust and outlasting hundreds of other stations, Mr. Blue Sky has been on with punk rock and comedy bits for more than a dozen years. Addr: Wellsville. (Jurens; Pearce)

Razorback Radio- Station operator Ferrill T. Hogg writes in to again confirm that his station has nothing to do with the 1980's pirate that used this same ID. Addr: Stoneham. (Direct from the station)

RBCN- 6955 at 0000. Radio Bob's Communications Network often broadcasts during the Atlanta Grove Communications Expo, but his funny shows are heard throughout the year. He sent MT two tickets for his next show. Addr: Atlanta. (Pearce; Kelly; Mello; direct from the station)

Secret Mountain Laboratory- 6954 at 1430. This old timer from the early 1980's resurfaces occasionally with a folk music program. If they announce the ancient Hilo, Hawaii, address, ignore it. Addr: Wellsville. (Yoder; Wolfish)

Sunshine Radio International- 6955 at 1830. Here's another Europirate that is sometimes heard in North America via NAPRS. Addr: Rueil. (Wolfish)

Up Against the Wall Radio- 6955 at 2330. Their digital computer disk QSL won the 1996 award for "Most Unusual QSL" in *The Pirate Radio Directory*. Dennis is happy to report that he received one! Addr: Providence. (Myhand; Yoder; Pearce)

Voice of Idiot Drivel- 6955 at 2100. VOID Radio has been mailing out the really nice QSL that we picture this month. Most of their shows use an AM transmitter, but some broadcasts are in sideband or CW Morse code. Addr: Pittsburgh or Merlin. (Philip Racza, Twinsburg, OH; Ross; Pearce; direct from the station)

Voice of Indigestion- 6955 at 0500. Despite the uncomfortable station name, their shows use a staple pirate format of music and comedy, albeit with occasional belches. Addr: None; sometimes verifies logs in *The ACE*. (Coatsworth; Prindle; Wolfish)

Voice of Juliet- 6955 at 0000. There has been some controversy about the spelling of this station ID, but as we see this month, their QSL ends the speculation. Addr: Merlin. (Williams; Jurens; Wolfish; Silvi; Pearce; McMahon; Ross; direct from the station)

Voice of Freedom- 6055 at 0200. This new one transmitted an elaborate countdown, but then announced cancellation of their broadcast. Addr: None. (Jurens)

Voice of Laryngitis- 6955 at 2100. Many people think

that this veteran station is the best pirate of all time. Genghis and Stanley Huxley's original comedy productions are sponsored by Friendly Freddie's Budget Burials, where death is cheap. Addr: Wellsville. (Wolfish)

Voice of the Daleks- 6955 at 0245. This Dr. Who spinoff broadcasts speeches by a gruff voiced Dalek military commander, who outlines his plans for taking over the universe. Addr: Stoneham. (Jurens; Wolfish; Prindle; Coatsworth; Mello; Ruger; Rose)

WEED- 6955 at 1800. They are among the marijuana advocacy pirates. Like most such stations, their music and comedy are entertaining, regardless of your opinion on their political stance. Addr: Huntsville. (Rose; Williams; Wolfish)

WHO- 6956 at 1700. Like the Voice of the Daleks, this station draws its inspiration from the British "Dr. Who" television series. Addr: Wellsville. (Wolfish)

WLIS- 6955 at 2100. If you can't find Jack Boggan's interval signals on the pirate bands, try Al Quagliari's excellent web page at <http://www.albany.net/~alcue/> for a dose of shortwave broadcaster tuning melodies. Addr: Blue Ridge Summit. (Coatsworth; Wolfish; Rose; Silvi; Murphy)

WMOM- 6955 at 2330. Dick snagged this new rock music pirate. Not much is known about them yet. Addr: None. (Pearce)

WPN, World Parody Network- 6957 at 0130. Captain Squirtlong programs rock music and comedy, with occasional comments on world events. Addr: Huntsville. (Coatsworth; Pearce; Kelly)

WREC- 6955 at 0130. P. J. Sparx has transmitted his third anniversary program of rock and comedy on at least two dozen occasions, so he's been widely heard. Addr: Wellsville. (Silvi; Coatsworth; Ruger; Pearce; Wolfish; Williams; Jurens; Rose; Prindle; Kelly; Racza; Hassig; Murphy; McMahon)

WRV- 6955 at 1830. Pete the Pirate at The Radio Virus has joined other pirates who sometimes operate during daylight hours, given the currently low sunspot counts. Addr: Wellsville. (Wolfish)

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Going Mobile

Most hams at one time or another decide they want to go mobile. "Mobile" can mean operation from your car, boat, airplane, motorcycle, or bicycle—your choice. Mobile operation (or simply "mobile" as hams call it), can be a lot of fun, especially if you have a long drive, or visit a lot of ham friends. Hams can talk you in when you're in unfamiliar territory, or they can just be good company as you're traveling from point A to point B.

Mobile today is largely carried out on VHF or UHF. Most repeaters have an autopatch (telephone connection) so the mobile ham can also make phone calls from his car or handi-talki.

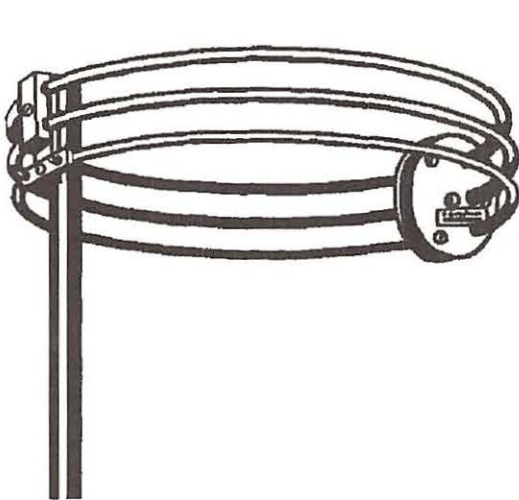
Today's small rigs fit almost anywhere in the car, and require only 12 volts to operate. FM on VHF/UHF has replaced AM, and simple vertical antennas make installing a mobile rig fairly easy on our higher bands. A lot of hams get in on the fun without the fuss by merely connecting their handi-talki to an external antenna.

■ Antennas That Travel

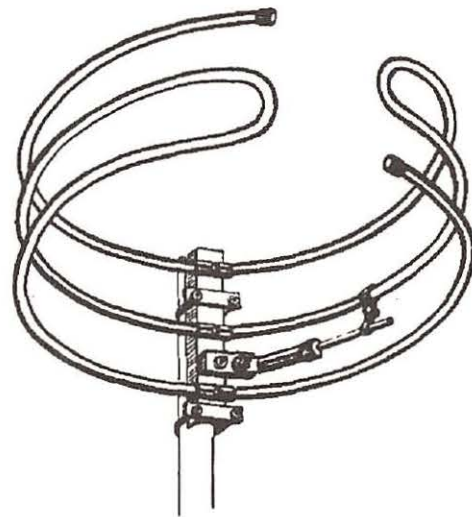
The small antennas on two meters and higher are easy to mount on a vehicle. The magnet mount antenna is perhaps the most popular way of mounting the antenna on a car. While magnet mounts work okay at two meters and higher, I prefer a solid permanent mount to provide a good ground plane for the antenna. As we go lower in frequency (i.e. six meters and down), by all means use a good mount... Yes, that means drill a hole in the car.

Your VHF/UHF antenna should, if possible, be mounted in the center of the vehicle roof. Barring that, get it as high as possible. In truth, that's the best place to mount any antenna, but of course the longer antennas required for HF simply won't go there!

On glass antennas: Several companies offer on-glass antennas for two meters and higher. Having tried several of these antennas, I can vouch for the Larsen as being the best of those tried. Even so, I strongly recom-



These 6 and 2 meter antennas from Hi-Par are the type of antennas used in the early days of VHF mobile.



mend a good ground connection at the feed point.

To gain or not to gain: High gain antennas are available which will provide extended range to our mobiles. I like the 5/8th wave antenna on two meters and use one all the time. If you are going to operate a lot of simplex mobile or operate in the fringe areas of the repeater, the gain antenna is a necessity.

Antennas for HF: Mobile HF antennas, for the most part, must be used with a ball mount which is attached directly to the vehicle, either by drilling a hole in the car or by installing a bumper mount. The bumper mount is not a bad choice if it is good and solid, and you make certain it has good ground connection.

Another optional location for mobile antennas is the trailer hitch. I made a hitch mount myself by fitting a one-foot piece of 1" x 1" steel channel into the trailer hitch, welding a piece of heavy, cold-rolled plate onto it, and drilling the plate for a standard ball mount. Again, be sure your ground connection is solid.

■ Modes

Since most operation is at VHF/UHF, FM is the most popular mode used in mobile today. However, there is a lot of SSB on the

VHF bands now, and of course that is the mode most used on HF.

A lot of HF hams are having a lot of fun running CW mobile. Of course, if you are going to use that mode, you should be able to copy code at a speed of 15 wpm or so in your head! Keep the CW exchanges short, and be sure to locate the key at a spot where you won't have to take your eyes off the road.

Mobile packet is becoming popular in some areas, too. For the most part, I find packet in the car to be distracting and difficult to operate, but many folks would say the same thing about CW. Personally, I can't read, type, and drive at the same time!

Even SSTV has a few advocates on mobile. Most of these operators simply send a pre-recorded tape and record the received signal for future viewing at the home station. I do know of a handful of hams running full bore SSTV via mobile, but again it's not something I would advocate trying while driving.

There's more to mobile, but I hope this is enough to convince you to take the rig along when you head out on the road or on vacation. There's nothing to it, and you'll be glad you did, especially if you have any car or map-reading trouble along the way. I invite you to write us with your mobile adventures when you get home! 73 de Ike, N3IK

SPECIAL EVENT CALENDAR

Monitoring Times is pleased to run brief announcements of radio events open to our readers. Send announcements at least 60 days before the event to: Monitoring Times Special Events Calendar, P.O. Box 98, Brasstown, NC 28902-0098. Fax 704-837-2216; e-mail mteditor@grove.net See MT's homepage on www.grove.net for complete listing.

Jul 4	Harrisburg, PA	Harrisburg RAC / Tom Hale, WU3X, PO Box 418, Halifax, PA 17032, 717-896-8087
Jul 5-6	Pascagoula, MS	Jackson County ARC / Charles Kimmerly, N5XGI, 19000 Busby Rd., Vancleave, MS 39565, 601-826-5811
Jul 6	Spec Event Stn	Cass Hubbard ARC operating N0SFJ, W4F0Q, KOVBM 1400-2000 UTC to celebrate Centennial of Walker, Minnesota. Op on lower 80, 40, and 20 meters. For certificate send QSL and SASE to Cass Hubbard Amateur Radio Club, Gen Delivery, Walker, MN 56484.
Jul 6	Salisbury, NC	NC Alligators Group / Walter Bastow, N4KVF, 3045 High Rock Rd., Gold Hill, NC 28071, 704-279-3391
Jul 7	Wilkes-Barre, PA	Murgas ARC / James Post, KA3A, 15 Monarch Rd., Wilkes-Barre, PA 18702, 717-825-3940
Jul 11-14	Albany, NY	YL Radio League Conv / Second Area Young Ladies ARC, Wanda Traver, N2JBK, 48 Carroll St., West Henrietta, NY 14586
Jul 13	Goshen, CT	So Berkshire ARC / Robert Schoenfeld, KA1ARR, Spring Hollow Rd., Sheffield, MA 01257, 413-229-8695
Jul 13	Clinton, ME	ME Council of ARC / Robin Walls, N1NFK, 34 Tufton St., Brunswick, ME 04011, 207-442-9405
Jul 13	Texas City, TX	Tidelands ARS / Carl W. (Bill) Steele, WA5WVP, PO Box 73, Texas City, TX 77592, 409-948-0308
Jul 13	Oak Creek, WI	S Milwaukee ARC / P.O. Box 102, South Milwaukee, WI 53172-0102, 414-762-3235. Location: Am Legion Post #434 grounds, 9327 S. Shepard Ave. 7am-2pm CDT. Talk-in 146.52s. Free parking, picnic, and camping. \$5 adm (incl free refreshments).
Jul 13-14	Indianapolis, IN	Central Div Conv / Rick Ogan, N9LRR, 5329 Lester St., Indianapolis, IN 46208, 317-251-4407
Jul 14	Sugar Grove, IL	Fox River Radio League / Diana Skube, WD9API, 4 N 210 Locust Ave., West Chicago, IL 60185, 708-293-7485
Jul 14	Auga, NJ	Sussex County ARC / Dan Carter, N2ERH, 8 Carter Ln., Branchville, NJ 07826, 201-948-6999
Jul 14	Bowling Green, OH	Wood County ARC / Larry Reitz, WA8CWD, 26785 Travy Rd, Walbridge, OH 43465, 419-837-2202, teckyreitz@aol.com . Location, Wood Co. Fairgrounds. Talk-in 147.180+ or 443.275+.
Jul 14	Kimberton, PA	Mid-Atlantic ARC / Bob Haase, W3SA, 674 Valley View Rd., Wayne, PA 19087, 610-293-1919
Jul 14	Pittsburgh, PA	North Hills ARC / John Sibenac, KE3PI, 216 Kinvara Dr., Pittsburgh, PA 15237, 412-487-2740. Location: Northland Public Library (10 mi N or Pitt. on McKnight Rd). Talk-in 149.69/09. Free adm. 8am-3pm.
Jul 19-21	Flagstaff (Ft Tuthill), AZ	AR Council of AZ / John Lanza, KC7IM, 1109 El Sonoro Dr., Sierra Vista, AZ 85635, 520-458-7069
Jul 19-21	Ocala, FL	International Radio Club of America (IRCA) annual convention
Jul 19-21	East Glacier, MT	MT State Conv / Bill Vodall, WA7NWP, Box 75, Kevin, MT 59454, 406-337-2222
Jul 19-21	Portland, OR	Pacific NW DX Conv / David Norton, AB9O, 2612 NW 18th Ave., Camas, WA 98607, 360-834-0140
Jul 20-21	Spec Event Stn	Fulton Co Dr. Mahlon Loomis Committee will operate W2ZZJ to commemorate the 170th birthday of Dr. Mahlon Loomis, the American radio pioneer, born at Oppenheim, New York. Operation 1300-2000Z on Gen class portion of 75, 40, 20 and 15 meters, and Novice 10 meter phone band. Also, on area 2 meter FM rpters. For parchment certificate and literature send QSL, contact # and #10 SASE (55 cents) to W2ZZJ, 5738 STHWY 29A, Stratford, NY 13470.
Jul 20	Belvidere, NJ	Cherryville Repeater Association / Marty Grozinski, NS2K, 6 Kirkbride Rd., Flemington, NJ 08822, 908-806-6944
July 20	Frankfort, NY	Utica ARC / Robert Decker, AA2CU, 2656 Oneida St., Utica, NY 13501, 315-797-6614
Jul 20	Wellington, OH	Northern Ohio ARS / Stan Zupan, AA8IN, 32549 Walker Rd., Avon Lake, OH 44012-2228, 216-933-4261
Jul 20	Huntington Mills, PA	Jonestown Mt Rptr Assn. / Peggy Dile, N3JRD, RR #3, Box 95-1B, Shickshinny, PA 18655, 717-864-3158
Jul 21	Cambridge, MA	MIT RS, Harvard Wireless Club / Steve Fineberg, W1GSL, PO Box 397082, MIT Branch, Cambridge, MA 02139, Nick Altnerburd, KA1MQX, 617-253-3776
Jul 21	Washington, MO	Zero Beaters ARC / Dave Neal, N0PNG, 247 Chesterfield Ind. Blvd., Chesterfield, MO 63005-1201, 314-458-3254
Jul 21	Van Wert, OH	Van Wert ARC / Louie Thomas, WD8LLO, 208 North Chestnut, Van Wert, OH 45891, 419-238-2812
Jul 21	Homer City, PA	Indiana County ARC / Gary Robison, K3SJJ, 177 West Burrell St., Blairsville, PA 15717, 412-459-8941
Jul 26-27	Oklahoma City, OK	Ham Holidays '96 / Hal Miller, KB1ZQ, 9230 North Penn Place, Suite 209, Oklahoma City, OK 73120
Jul 26-28	Bloomington, MN	Central States VHF Conf / Chuck Munce, K0GJX, 4309 North Brookdale Dr., Brooklyn Park, MN 55443, 612-566-1934
Jul 27	Tampa, FL	Univ of S Fla / Doug KD4HVC, 4202 E Fowler Ave CTR 2416, Tampa, FL 33620, 813-979-0033, douglass@suntan.eng.usf.edu . Location: USF on Fletcher Ave between I-75 and I-275. 9am-3pm. Talk-in 146.94-, 147.24+, 442.275+. \$3.75 admission.
Jul 27	Rockford, IL	Rockford ARA / Marsha Plasters, 3408 Ed-Vera Dr., Rockford, IL 61109, 815-399-9233
Jul 27	Leesville, LA	W Central LA ARC / Jeff Shifflett, KC5GVS, 1102 Westwood Ave., Leesville, LA 71446, 318-239-9724
Jul 27	Asheville, NC	W Carolina ARS / Ron Carmack, KE4SSO, 70 Tipperary Dr., Asheville, NC 28806, 704-665-9399
Jul 27	Berwick, PA	Columbia-Montour ARC / Dave Schack, WC3A, PO Box 73, Berwick, PA 18603, 717-752-6851
Jul 27-29	Spec Event Stn	Oshkosh, WI: W9ZL operated by Fox Cities ARC (Appleton, WI) from the Experimental Aircraft Assoc. Fly-In and Convention, from Pioneer Airport adjacent to EAA Aviation Museum. Gen portions of HF bands, RTTY and CW as conditions and operators permit. Send QSL & SASE to Wayne Pennings, WD9FLJ, 913 N. Mason, Appleton, WI 54914 for picture certificate. (On grounds convention info on 146.520s: no QSLs please)
Jul 28	Timonium, MD	Baltimore RA TV Soc / Robert Koblish, N3HAT, PO Box 5915, Baltimore, MD 21208, 410-467-4634
Jul 28	Alexander, NY	Genesee Radio Amateurs / Thomas P. McCormick, N2VTN, 10920 Sandpit Rd., Alexander, NY 14005, 716-591-2864
Jul 28	Ashtabula, OH	Ashtabula County ARC / Ken Stenback, A18S, 722 Lyndon Ave., Ashtabula, OH 44004, 216-964-7316
Aug 2-4	Austin, TX	TX State Conv / Joe Makeever, W5EBJ, 8609 Tallwood Dr., Austin, TX 78759, 512-345-0800
Aug 2-4	Park City, UT	Rocky Mt Div Conv / Duane Anderson, KJ7HO, 443 East Brandt Ct. #30, Salt Lake City, UT 84107, 801-288-1859
Aug 3	Escanaba, MI	Delta Co ARS / John Anderson, WD8RTH, 405 South 10th St., Escanaba, MI 49829, 906-789-9148. Location U.P. State Fair Grounds.
Aug 3	Springfield, MO	MO State Conv / Karen Thorpe, N0TDW, 2145 E. Crestview, Springfield, MO 65804, 417-889-6775
Aug 3	Clayton, NY	Jefferson Co RAC / Janet Long, N2ZMS, PO Box 523, Brownville, NY 13615, 315-788-8543
Aug 3	High Point, NC	High Point ARC / Mark McMahan, KB4MFP, PO Box 1163, Jamestown, NC 27282, 910-887-3039
Aug 3-4	Jacksonville, FL	No Fla Section Conv / Vern Ferris, KB4VPU, 356 Aries Dr., Orange Park, FL 32073-3262, 904-272-7250. Location: Osborn Convention Ctr nr I-10 & I-95, 9am-5pm Sat, 9am-2pm Sun. \$8 registration.
Aug 4	Peotone, IL	Hamfesters RC / David Brasel, NF9N, 6933 West 110th St., Worth, IL 60482, 708-448-0580
Aug 4	Wellesley, MA	Wellesley ARS, Babson Wireless Club / Barbara Holdridge, N1ICQ, 107 Church St., Westwood, MA 02090, 617-329-2628
Aug 4	Fowlerville, MI	Livingston ARK / Ray Melosh, N8CPO, 4349 East Allen Rd., Howell, MI 48843, 517-546-9209. Location: Fair Grounds 8am-2pm. \$5 gen admission. Talk-in 146.68-, 145.21-



Just
do
it!

Do you have a topic you've always "thought about" writing up for Monitoring Times? Now is the time! Given our full-spectrum coverage, plus the interest in new technology on the one hand and nostalgia for the past on the other, there is no limit to appropriate subject matter to write about. Bone up on your research, warm up your pen, and you, too, can earn a little spending money!

Pitch your idea to the editor at mteditor@grove.net or call 704-837-9200 and ask for Rachel. Writer's Guidelines are available on the MT homepage at www.grove.net, or for an SASE.

Revitalizing Older Receivers

It's difficult to pass up a bargain when we see an older tube type of receiver at a ham radio flea market, or when a friend offers one to us at modest cost. Nostalgia, the glow of the tube filaments, along with large dials, knobs and cabinets, bring visions of the good old days when the communications art wore a different face.

A great many receivers from the past are still available. Among them are the National Radio, Hallicrafters, Collins Radio, and Hammarlund products. Some of the very early commercial receivers were of the regenerative type, such as the National Radio SW-3, the Bretting 12, and the Crosley Super Wasp. With the advent of the superheterodyne technology came such receivers as the RME 69, Hallicrafter's S-38 and S-20R, along with the National NC-100.

The Hammarlund HQ-129X came later on, and was considered by many the top of the line amateur receiver. The Collins Radio 75-S1 opened the door to high quality performance by virtue of good frequency stability and 1-kHz resolution of the frequency read-out. Getting one of these old chestnuts up and running can be a pleasurable and rewarding workshop experience. This article provides some tips for breathing new life into tired old receivers.

■ First Things First

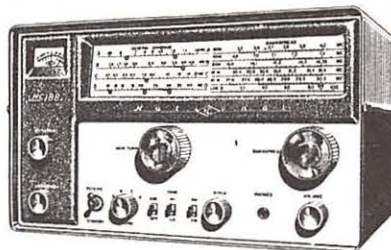
Your recently acquired bargain-price receiver should be turned on and checked for signs of life before you move ahead with the finer points of revitalization. Make certain that the filaments of all of the glass tubes are lit. After a 10-minute warmup you may carefully touch the metal tubes (if any exist) to ensure that they are alive. If so, they will be warm or hot to the touch.

The next step is allowing the tubes to cool, after which they should be checked for emission, shorts, leakage, and transconductance by means of a tube tester. If you don't have access to a tube checker, you can substitute new tubes for the old ones, one at a time, while observing the receiver performance (volume of a signal heard in the speaker). A signal generator is a great help for this performance test. Best results will be had while making the foregoing tests at 21 or 28 MHz,

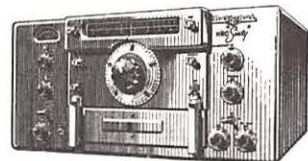


Above, the GPR-90 from its first ad in QST magazine, October 1956.

Below, the National HRO-60 receiver seemed to be "all business."



At left, the National NC-188 featured a clean front panel layout with broad horizontal tuning display.



At right, the 10-tube Hammarlund HQ-100 superheterodyne had automatic noise limiter, electrical bandspread and Q-multiplier.



since most older receivers tended to "run out of gas" at the high end of their frequency ranges.

When you are satisfied that all of the vacuum tubes are okay, turn off the receiver and allow it to cool down. At that time it is wise to remove the tubes, one by one, and squirt a quality grade of contact cleaner into the tube-socket pins. Work the tube up and down in the socket a few times to ensure that any film and corrosion build-up is removed.

■ Power Supply Check is Next

Turn on the receiver and set the audio gain control at minimum. Listen with your ear near the speaker (or use headphones) to determine if hum is audible. It may be quite loud. If so, the filter capacitors in the power supply have probably dried out and lost their

capacitance. This condition will cause moderate to loud hum. Replace the capacitors with new units of equivalent or greater capacitance and voltage ratings.

If the rectifier tube flashes and arcs when you turn on the receiver, chances are that the filter capacitors are shorted, or that a short circuit exists somewhere beyond the power supply. Short circuits must be located and remedied before further work is done to the receiver. Unplug the receiver from the wall and trace the B+ paths while using an ohmmeter set for the low-ohms range. It may be necessary to disconnect the various legs of the B+ circuit in order to pinpoint the section where the short exists. Finally, check the power supply output voltage (after any needed repairs). Typical output voltage will be in the 225 to 250-volt dc range.

■ Visual Inspection and Capacitors

This is a proper time to use your magnifying glass to inspect each resistor and capacitor under the chassis. Look for burned or discolored resistors and replace each suspicious unit that you spot. Examine the fixed-value capacitors for oozing electrolyte or broken pigtailed. Replace all "iffy" capacitors with new units, preferably disc ceramic parts with a 500- or 600-volt rating.

In fact, a thorough revitalization is best accomplished when you replace all of those old tubular paper capacitors with new disk-ceramic units. Having done this many times myself, I can say that some receivers really came alive because the original capacitors were leaky and some had changed value with time. Furthermore, disk ceramic capacitors are less inductive, and therefore are more effective for bypassing critical points in the RF circuitry.

■ Noisy Controls

Noisy controls and switches are frequently encountered in old receivers. The thin carbon coating inside the potentiometers wears out and causes dead spots in the range of the control, along with an annoying "scratching" noise when the controls are adjusted. Applications of contact cleaner to the inside of the controls offers temporary relief from this problem, but the malady will return later on.

Worn controls should be replaced with new units of equivalent resistance and taper. Controls with an audio taper are required for the audio and RF gain circuits. Linear-taper controls are suitable for tone controls and S-meter adjustment potentiometers.

Band-selector switches in old radios often have worn or dirty contacts. The various wafers on these switches should be sprayed with a contact-restorer type of cleaner, then worked back and forth through the switch range several times to remove oxidation and possible tobacco-smoke film. Dirty switch contacts become resistive, and this condition can have a marked effect on overall receiver performance. After cleaning the switch contacts it is a good idea to place a drop of light oil on the bearings of the switch detent mechanism. Avoid allowing the oil to reach the wafer-switch contacts.

■ Receiver Alignment

Most operating manuals for older receivers contain a section that describes the alignment procedure for the various padders and trimmers. It is important to follow the manufacturer's instructions during this step of revitalization. If no booklet is available, use a

well calibrated signal generator, or a signal from your modern transceiver (lowest output power possible, and don't connect it to your receiver!) to adjust the oscillator for correct dial calibration on each band. The RF amplifier trimmers or coil slugs can then be peaked for maximum signal response in the center of each frequency range selected by the band switch. The receiver S meter may be used as an indicator when peaking these circuits.

The trimmers or slugs in the IF (intermediate frequency) transformers should be adjusted for maximum signal response as the last step in alignment. If the receiver has a BANDSET and BANDSPREAD dial, be sure to set the BANDSPREAD dial for the low end of its range before commencing alignment.

■ Other Band-aids

If the receiver has low audio output after the foregoing cleanup jobs have been completed, try replacing the cathode bypass capacitor at the audio output tube. Generally, any value from 10 μ F to 22 μ F at 16 VDC or greater will suffice.

Fuzzy or distorted audio output can be caused by a defective speaker. A bad speaker can be checked by using headphones to sample the audio. If the output is clean, remove the speaker and examine the cone for rips and tears. If the cone appears okay, push the apex (center) gently up and down with your finger. If you hear a scratching sound, chances are that the voice coil is rubbing on its metal core. The cone should move freely without any evidence of rubbing. The cure for this problem requires replacing the speaker.

If the dial cord is frayed or broken you may replace it with high quality, fabric-based, casting-rod fishing line. I recommend black silk line for this job. Lubricate all of the dial-cord pulleys and tuning shafts, but avoid getting oil on the dial cord or pulley slots.

The bearings of the tuning capacitors should be sprayed liberally with contact cleaner to ensure that a good electrical connection prevails between their rotors and frames. Dirty bearings can cause frequency jumping and drift.

Soiled cabinets (smoke film and such) can be cleaned by applying Fantastik or a similar household cleaner. A coating of Pledge or equivalent household wax will provide a sheen after you have removed the grime.

■ Summary Remarks

Certainly, much more can be involved in bringing an old receiver back to like-new performance, but the tips offered in this article should be sufficient for getting the job done. All operating voltages should be checked

at the tube sockets to verify that each stage is operating properly. Many of the manuals for old receivers contain a voltage chart that can be referred to while using a dc voltmeter.

If the voltage is substantially lower than specified at some point in the circuit, look for a dropping resistor that has increased in ohmic value. Check also for a leaky (partially shorted) bypass capacitor in the suspected leg of the circuit. Specifically, check the bypass capacitor that is on the tube side of the dropping resistor.

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July 1996

MONITORING TIMES

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What's New in Oceanic Air Traffic Control

Welcome aboard! Is a trip across the ocean in your summer plans? Oceanic Air Traffic Control is a very different ballgame from domestic ATC operations. In the December column, we dropped a few hints that Oakland Air Route Traffic Control Center was in the process of updating and installing new state-of-the-art equipment in their oceanic sectors. Today, with information provided by Oakland Center's Larry Clark, we'll see how this equipment will change and update oceanic operations. First, though, some background information is required in order to understand what's on the horizon.

Oceanic systems are presently located at three air route traffic control centers: **Anchorage, AK; Oakland, CA; and Ronkonkoma, NY.** Projections indicate a 50% increase in North Atlantic traffic and a 100% increase in Pacific travel over the next decade. Because of these projections, system capacity has become a concern.

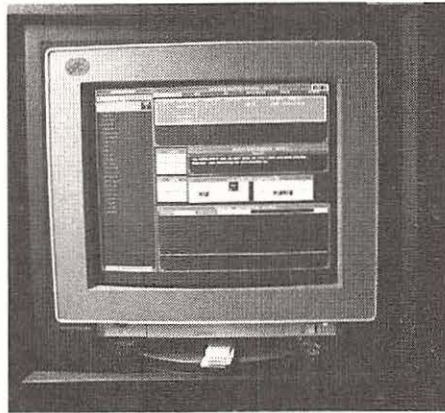
Most recently, oceanic air traffic control systems were comprised of manual operations, large separation standards, and cumbersome communications—all of which contribute to system limitations. The majority of high density oceanic air traffic uses track systems with defined waypoints. Oceanic ATC monitors traffic via hourly position reports and manually tracks this information on paper flight strips. This system cannot easily accommodate user needs such as preferred routing, flight profiles, or requested changes.

■ Upgrading one step at a time

The starting point for the oceanic system's evolution to the end-state was the Oceanic Display and Planning System (see *Plane Talk*, February 1995 for a more detailed description of ODAPS). This system was designed to provide the initial level of automation and assist the controller as a planning tool, limited to flight strips and a situational display of estimated aircraft position.

Planned oceanic system enhancements will provide capabilities equivalent to or exceeding those currently available within the US domestic system to improve the system's performance and meet the projected growth in demand. These enhancements will evolve through an incremental approach.

Today, oceanic operational equipment is entering an intermediate stage of develop-



CRT Display for the New OAS System

ment with integrated equipment known as the Oceanic Automation System, or OAS. The development of these replacements as the OAS interim system platform is well underway, using open system architecture which allows the easy integration of new technologies as they become available. At Oakland Center's Oceanic Operations, a Telecommunications Processor replacing the old Flight Data Input/Output device has already been installed, and a prototype Oceanic Data Link (ODL) is on line at one of the oceanic sectors.

There are very aggressive plans to have ODL in *all eight* oceanic sectors by mid-1997. Software development is on an ongoing basis to get that component completed; also, the Plan View Display (traffic display) is to be replaced with a Sony color Situation Display by the end of this year.

■ Automated air-ground data comms

The prototype Oceanic Data Link is a significant software enhancement to the telecommunications processor (TP) currently in use. It provides direct communications to FANS-1 (Future Air Navigation System) equipped aircraft, as well as to other OAS ground systems. Automated message capabilities from the oceanic controller are the first step in providing controller communications to the aircraft via data link. This function reduces communication delays and provides a digital message capability to other facilities and flight information regions. The prototype ODL automated message capability uses message sets that follow international standards.

The corresponding equipment package for aircraft (FANS-1), developed by Boeing and Honeywell, is being installed in some of the 747-400 series. Not all of the airlines whose fleets include 747-400s have purchased this very expensive equipment. United had to modify 24 of their 747-400s—a *costly* modification! It takes at least three days to install, and it hurts the airline to have an aircraft out of service for that length of time. Nonetheless, the airlines believe that the benefits will outweigh the costs in the long run.

The Oceanic Data Link will provide the foundation for Automatic Dependent Surveillance (ADS) data communications between the US and foreign centers, and ultimately, will allow reduced separation standards over oceanic airspace. A new generation of surveillance capabilities will enable the OAS to receive and process precise satellite position data via ADS waypoint messages that can be automatically generated by the aircraft flight management systems. This will provide improved waypoint report accuracy and minimize the potential for human error in the reporting process.

■ Better ground-ground coordination

An ongoing activity to provide ground-to-ground communications is the Air Traffic Services Interfacility Data Communications (AIDC) System, which provides better ATC contact and coordination between Alaska and Russia. AIDC uses a digital satellite link to increase the safety, capacity, and efficiency of international routes over the Russian Far East airspace. Prototype controller workstations installed in the control centers at Anchorage and Anadyr (Russian Far East) and Petropavlovsk-Kamchatsky (RFE) allow air traffic controllers to compose and transmit flight planning and coordination data to other air traffic facilities.

The new equipment will take Oceanic Air Traffic Control well into the 21st century with installation completed around 1998 - 1999, and preparations on the way to completion for the automated dependence surveillance and data link era by then.

Next month we'll feature a look at a new device that's being tested for domestic ATC use, have our usual readers corner, and a list of frequencies from Louisville and Cincinnati. Until then, 73 and out.

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Eavesdropping on Mission Control

As you are most likely aware, *Monitoring Times* has a sister publication—*Satellite Times*. It is an excellent magazine for the space buff in all of us. The current *S/T* issue has a very thorough breakdown of the complete frequency management system used at the Kennedy Space Center and the associated military launch areas in Florida, Patrick Air Force Base and Malibar. I am not going to draw from that list in this column, but I do recommend you send in your \$2 and an SASE for a copy of the article if you're not a subscriber. Bob Grove deserves a lot of credit for the time and effort he put into verifying these frequencies.

What I am going to examine this month is from an associated column in the same issue. The title of the feature is "Mission Control—Touring NASA's New Facility in Houston" by Haskell Moore. NASA's new Mission Control Center is in a new wing of the building adjacent to the old Mission Control in Building 30. For an examination of the complex I refer you to Moore's excellent article. What we are going to look at are the frequencies used at the Mission Control facility.

Mission Control Center

Frequency	Usage
123.125	NASA air operations with Ellington AFB (AM)
154.280	Mutual aid with surrounding cities
155.265	Civil defense with surrounding cities
155.370	Intercity police
164.200	Johnson Space Center (JSC) security net
164.700	Construction net rptr in/ out 170.350
164.9875	NASA administrative net
168.000	Environ/maint net rptr in / out 169.000 Bldg 1
168.450	Medical net rptr in / out 170.375
169.000	Environ/maint net rptr out / in 168.000 Bldg 1
170.100	Public affairs net rptr out / in 171.000
170.350	Construction net rptr out / in 164.700
170.375	Medical net rptr out / in 168.450
170.750	Aircraft operations
171.000	Public affairs net rptr in / out 170.100
171.150	NASA select audio feeds
172.300	NASA transportation net in / out 173.8125
173.6625	Painting net



Photo courtesy of NASA

173.6875	Procedures net
173.8125	NASA transportation net out / in 172.300
235.400	NASA air to ground (AM mode)
407.1750	NASA medical net in / out 409.1750
409.0250	NASA paging
409.1750	NASA medical net out / in 407.1750
429.6725	Bridge crane ops (Isn't this the shared amateur band?--hm-m-m)

As was pointed out in the *S/T* article, NASA also shares a 10 channel trunked system along with other federal government users in the Houston area. This ties right in with a trend I predicted over a year ago when the trunked system was first noticed in the Miami, Florida, area. At first the FBI had a couple of units on it. Then the Secret Service got a little extra money and added some radios up there. Now the spectrum is filling up. Given this pattern, it seems likely that anyone monitoring all of the output channels of the Houston trunked system will hear a lot more than just the Mission Control Center.

With that little bit of intelligence out of the way, here is the breakdown of the Houston trunked system.

Federal Trunked System in Houston

Channel	Output	Input
01	406.350	415.150
02	407.150	415.950
03	407.950	416.750
04	408.550	416.550
05	408.750	417.550
06	408.950	417.750
07	409.150	417.150
08	409.550	418.350
09	409.750	418.550
10	409.950	417.950

If you are ever in the Houston area, you can visit the Johnson Center, which is located 25 miles south of downtown Houston. There are many tours you can go on and a good time is guaranteed. Their telephone number is (713) 244-2100.

Which pen is mightier?

I received some very interesting intercepts from a monitor who, because of his position, wishes to remain anonymous. In the recent March column I did a very brief synopsis of the federal prison system. The following additional information comes from the federal prison in Manchester, Kentucky.

The prison has an automated fence alarm on 170.925 MHz. There has never been any voice traffic monitored on this frequency, but one can hear the alarm sounding if the fence is tripped—by birds flying through the beams, sitting on the fence, etc.

At the federal medical facility in Lexington, Kentucky, the frequency of 170.875 MHz is the primary frequency and the frequency of 170.925 MHz is the secondary. Voice traffic has been monitored on both channels. The



call sign is KVL311. For several months in 1995 a single tone of approximately 1000 Hz was sent out on 409.2500 MHz about once every five minutes. Suddenly this went away and has not returned.

As for normal tactical procedures, the radios containing the riot tactical frequencies are kept under lock and key and are only brought out during an emergency. None of the radios carried by the guards have the emergency frequencies in them. This allows the prison officials to carry on communications in the event the prison is taken over and the normal radios are captured by the inmates.

■ Keep 'em guessing

In previous columns we have discussed the possibility of government agencies utilizing radio frequencies outside of the normal federal allocations. In the early 1980's, the Postal Inspectors in the Miami, Florida, area were reported to be using a set of frequencies which did not fall within the normal federal allocation. When postal authorities were questioned about them, they became nervous and put up a blanket denial of the system.

Sources that have proven reliable in the past inform this writer that the following frequencies (MHz) were, and still may be, in use for very sensitive operations. The equipment was kept in the Atlanta area and shipped out when it was needed.

Postal Inspection Frequency Pool (unverified)

547.2275	549.2000	549.2250
549.5000	549.5250	549.7000
549.7250		

It is unknown what, if any, repeater pairs were in use and which were the simplex channels. It is even unknown the exact utilization of these channels ... Two way voice? Package tracking? Hidden body transmitters? ... Still, it might make good monitoring in a congested area where there is no corresponding television channel on that frequency.

As an update, here is the current radio frequency allocation for the Postal Inspectors and the Postal Security Force.

Postal Inspectors

Chan	Frequency	Use
01	407.7750	RPTR INPUT
	414.7500	RPTR OUTPUT
02	414.7500	SIMPLEX
03	407.7250	RPTR INPUT
	415.0500	RPTR OUTPUT
04	415.0500	SIMPLEX
05	408.0500	RPTR INPUT
	413.6000	RPTR OUTPUT
06	413.6000	SIMPLEX

Postal Security Force (Security around post offices, etc.)

Chan	Frequency	Use
01	418.3000	SIMPLEX
02	416.7750	RPTR INPUT
	418.3000	RPTR OUTPUT

The private/line tone for the above is YZ.

For those of you living in the Southern California area, here is a list of submissions I have received on frequencies used by postal facilities not fitting in the above band plan. All of the sites listed are in the Los Angeles area.

So Calif Postal Band Plan

Frequency	Location
170.6000	Bell postal facility
170.1250	Main L.A. post office facility
163.3750	Pasadena center
410.1000	Pasadena center rptr input-out is 406.2250
406.2250	Pasadena center rptr output-in is 410.1000
166.2250	Van Nuys sorting center
164.9875	Pasadena transportation center
410.3250	Rail operations---Channel 1
410.3500	Rail operations---Channel 2
162.2250	Transportation net
410.2000	Transportation rptr input---out is 414.7250
414.7250	Transportation rptr out---input is 410.2000
418.1000	Maintenance network
164.9625	Airport mail facility

■ Disaster Preparedness

A reader submitted three frequencies for the Department of Health and Human Services. The first, for the *National Earthquake Emergency Network*, is 164.3000 MHz. The other frequencies are for the *Bethesda Medical Center*: 411.4500 MHz and 413.4250 MHz. It is unknown if these are repeater pairs or simplex channels.

The *National Emergency Training Center* operates on the following frequencies:

163.1000	166.2250
168.3500	169.6000 MHz.

The *National Emergency Warning System* allocated the following frequencies to its *Regional Emergency Operations Center*:

Net 1:	173.1875 rptr input / 167.9750 rptr output
Net 2:	167.9750 MHz simplex
Net 3:	169.8750 MHz simplex
Net 4:	167.9250 MHz simplex

The *Civil Defense National Warning System* uses the following:
164.8625 165.6625 MHz

I have never heard any traffic on any of these channels. When I questioned friends that work in regional emergency shelters, they were not aware of the existence of these channels. Can any of you provide any assistance?

■ Last but Not Least

Frequencies for two relatively unknown agencies were submitted to me this month. The first is the National Highway Traffic Safety Administration. This agency carries out programs and studies that are aimed at the reduction of economic losses due to motor vehicle crashes, administration of the federal odometer law, issuing theft prevention standards, and the issuance of average fuel economy results.

National Highway Traffic Safety Administration

Chan	Frequency	Use
01	36.150	RPTR INPUT
	40.970	RPTR OUT
	40.970	RPTR OUT
	36.150	RPTR IN
02	40.260	SIMPLEX

The second agency is the Maritime Administration. This is the agency that is responsible for the maintenance of the United States Merchant Fleet through the Merchant Marines. For those of you that have relatives that fought in World War II, ask them about the importance of the merchant fleet in the North Atlantic trying to outfox the U-Boats while carrying gasoline on unarmed ships!

Maritime Administration

Frequency	Use
166.1500	NATIONAL ASSIGNMENT
169.0750	NATIONAL ASSIGNMENT
165.5875	SOUTHERN CALIFORNIA REGIONAL OFFICES
16.565	NATIONAL DEFENSE RESERVE FLEET (short wave freq)

That wraps it up for this month. I look forward to receiving some good monitoring reports from readers who are in the Atlanta area during the Olympics. Also, the Grove Communications Expo '96 is just a few months away. Hope to see you there.

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ICR7100 25 MHz to 2000 MHz AR3000A 100 KHz to 2036 MHz MVT8000 8 MHz to 1300 MHz

ICR9000 100 KHz to 2000 MHz AR3030 30 KHz to 30 MHz

ICR7000 25 MHz to 1000 MHz 1025 MHz to 2000 MHz



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Ingenius' XChange Revisited

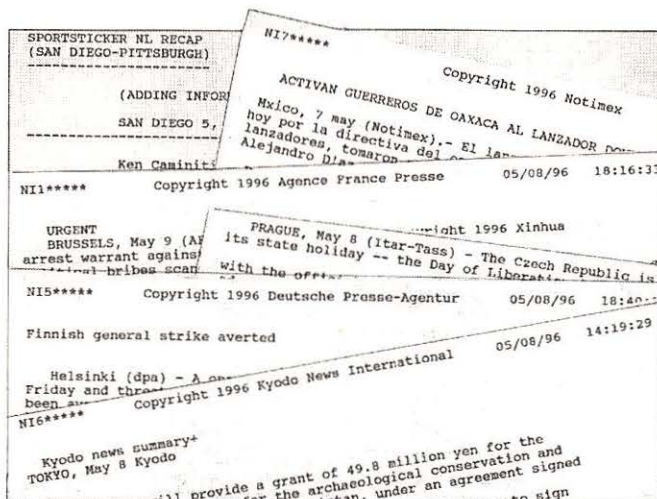
My wife always tells me there's no such thing as bad publicity. And it always surprises me when products of dubious distinction are promoted *ad nauseam* while terrific products which ought to set the world on its side languish for lack of publicity. I've devoted a fair amount of ink in this column over the years to a certain text service which is so great that I am compelled to do it again. Hence: An update on XChange, the peerless, satellite-delivered news service from Ingenius.

■ Living With The Future

Futurists have been predicting that newspapers will be delivered electronically for decades. At one point it looked as though teletext services such as the late Electra or InfoText would fill the bill. Teletext was without doubt a complete flop. Not that it didn't have its supporters nor that it didn't serve at least some purpose. But the public never embraced it, partly because publicity—good or bad—eluded it, and partly because it was never more than a headline service. In addition, there was no way to save documents, though there was a thermo-style printer available at one time.

The service which calls itself Ingenius started as X*Press Information X*Change nearly a decade ago. Originally, the service was available to cable and satellite TV viewers who signed up and paid for the proprietary data receiver and software. After that the service was available 24 hours a day, year round for an annual subscription fee. The data receiver, called the InfoCipher 1500R, was made by General Instrument. For reasons known only to GI, production on the InfoCipher was halted and the last units were sold in mid-1995.

Seeing the DBS handwriting on the wall, Ingenius signed to have the data signal transmitted on the PrimeStar system and, accordingly, PrimeStar receivers had the necessary data receiver built in. Existing C-band Ingenius customers continue to be served via a data stream on Galaxy 5 channels 5 (CNN) and 6 (TBS), but the emphasis for the future is with PrimeStar.



■ World View News

I don't want to detract from Internet users who assure me that they get all kinds of great news services on The Net. But, the attraction for XChange is the breadth as well as the depth of the coverage. Here, full text, actual wire services from all over the world are fed continuously 24 hours a day into your personal computer. Urgent news bulletins and full length articles are received at your home just as they are at the newspaper office. You be the editor!

You decide which services you want and, if you like, you can create files and save certain articles to those files. You can print anything that looks interesting or delete that which doesn't.

Imagine having wire services from the following installed in your home and operating 24 hours a day: Reuters (U.S. and World news), Itar-Tass (Russia), Deutsche Presse-Agentur (Germany), Kyodo News International (Japan), Xinhua (China), Notimex (Mexico, in Spanish!), Agence France Presse (France)—and that's just for news. You also get complete financial news from Reuters including stocks, commodities, currencies, bonds, market reports from around the world, and you can even track your own stock portfolio from the thousands listed on the NYSE, ASE, OTC, and NASDAQ with only a 15 minute delay (the pros can't beat that!). You also get business press releases direct from the Business Wire.

■ The Sports Wrap

If you're a sports fanatic you'll love having the same SportsTicker service that's used in the press boxes of all the major league sports. You get inning by inning updates of every major, minor league, and college baseball game being played. You get lengthy commentaries from sportswriters, league standings, trade announcements, box scores, and an unending stream of statistics.

And, in season, you get the same treatment for football, basketball, hockey, motor sports, horse racing, skiing, golf, cycling, boxing—you name it! Did I mention cricket, badminton, volleyball, and the Olympics? Even chess! There is so much sports information available on XChange that you could delete all the other categories and fill up your computer with just sports in no time.

■ Weather Watch

XChange keeps its weather eye open for you in three categories. You get international, national, and state weather reports. The International report gives you temperatures, conditions, and two day forecasts for all the major cities of the world. It also displays important news stories of a meteorological interest. Earthquake reports are found here, too.

The national category gives detailed weather summaries of the nation's weather conditions with forecasts, as well, for a hundred different cities in the U.S. The state category allows you to eavesdrop on National Weather Service summaries for every state in the Union. Here, you'll get full forecasts and climatological data for specific regions of each state.

There is so much weather information available you'll want to tailor this category to those states of particular interest: if you are planning to travel or have friends or relatives in a particular place, you can see what it's like where they are. This is particularly useful in the winter and during the hurricane season (hurricane tracking information is displayed as soon as it's issued by the National Hurricane Center in Miami).

■ And All The Rest

Really, that's just for starters: there's entertainment, Hollywood type news, "lifestyle" and fashion reports, soap opera updates, even TV schedules. You would need to be four people using as many computers to get and use everything available on this service in one 24 hour period.

XChange gives you movie, music, and book reviews; opinions and editorials; trends and events, and more. There's a category to alert subscribers to new services or changes in service as they happen.

In addition, XChange transmits a variety of software for your personal use. Software for utilities, entertainment, games, updates, and demonstrations are all fed via the data stream during the early morning hours—typically from midnight to 6 a.m. Eastern time. The software is usually sent compressed and comes with registration instructions.

XChange software allows subscribers to tailor the news toward their own interests. XChange can search all news stories for keywords entered by the subscriber. Alarms can be set to alert the user every time a story is filed containing the keyword. Similarly, alarms can be set with your personal stock portfolio to alert you to highs or lows or unusual activity in any of your 250 tracked securities. You can even create chart windows to display a graph of historical data for any given ticker symbol ... all of which can be printed at any time.

XChange is part of the Cable in the Classroom project. If you are a teacher, you'll want to take advantage of this program as thousands of schools around the U.S. already have. XChange offers, through the data stream, lesson plans and teaching materials for use in the classroom.

■ Basic Requirements

To be able to receive XChange services at your home, here's what you'll need: an IBM or compatible PC with a 386 or higher microprocessor (I've even used an antique 8088 machine with no problem); at least 4 MB of random access memory; a hard drive with at least 6 MB space available; either a 5.25" or 3.5" floppy drive; an RS-232 serial communications port configured as COM1, COM2, COM3, or COM4; VGA or higher graphics adapter; Microsoft Windows version 3.1 or later (again, I've used the DOS version with the 8088 with no problems); Ingenius Interface Kit (program disk/manual, data receiver, connecting cables); cable TV installation, or Primestar installation, or (if you're really lucky) a C-band installation with a used

InfoCipher 1500R data receiver. You'll have to find the latter used, remember; they're not making them any more but they are still serving the C-band market.

■ Bottom Line

If you're currently a cable subscriber and want to subscribe to XChange, call their toll free number to order the Ingenius Interface Kit. Current price for the cable kit is \$150. If you're a Primestar customer you'll need to call the order number and get the software and manual. Start-up cost for Primestar customers is currently \$100.

If you're nowhere near a cable system and have been toying with the idea of getting a satellite TV system, XChange may be just what you've been waiting for. XChange is not available on DirecTV or USSB, nor will it be on the DISH network or AlphaStar, when it's launched. Primestar has XChange pretty well locked up. But, it's not a bad deal: typically, Primestar costs only \$150 for the complete system installed and roughly \$30 per month for their basic services. A one year subscription to XChange is only \$59.40 per year.

There's an even better deal in store for most cable customers. After shelling out the \$150 for the interface kit and software, a one year subscription will be \$59.40 or FREE! According to an Ingenius sales representative, most cable companies provide XChange as part of their basic package, and there will be no subscription charge. Cable customers should call Ingenius and find out where their local cable system stands. For more information about XChange call 1-800-7PC-NEWS.

■ Satellite News Notes

• By the time you read this, and barring any more launch disasters, there will be two new satellites in the Clarke Belt. Hughes' Galaxy 9 (a 24 channel, 16 watts per channel) C-band-only satellite will replace the fading Telstar 303 at 123 degrees west. It is thought that it will eventually be moved to a currently unused slot between Galaxy 5 and Satcom C3.

The other new kid on the Belt is General Electric's GE1 which will be located at 103 degrees west. This satellite features 24 C-band channels with between 12 and 18 watts per channel and twenty-four 60 watt channels in the Ku band. Design lifetime of both these satellites is expected to be 15 years. That should give you an indication of how long C-band services will continue to be provided.

• General Instrument is said to be readying the release of its digital receiver (temporarily dubbed the "Triple Play") for analog, VCI

encrypted, and Digicipher capable receiver. There's no word on what the retail price will be for this unit, but one imagines that it will be comparable to the current top-of-the-line models and sell in the \$1,500 to \$2,000 range.

• In the Old-Wine-In-New-Bottles Dept: Heavy advertising for the DISH network has been seen on many TV screens. This is another in the 18 inch satellite TV parade and joins DirecTV, USSB, Primestar and Alphastar in its hope to serve an apparently unlimited and TV-starved market in the U.S. Programming line-up will be virtually identical to everyone else's; the pricing scheme will start at \$10 per month for a minimum of 10 basic services and sky-rocket to match the monthly balance of your checking account, with just enough left over to pay the electric bill.

The big pay-off on this scheme is for the dealers who sell the units and the programming to go with it. Dealers can earn up to 11 per cent of your monthly bill for up to five years. It's a great incentive to make sure you sign up for the most programming you can possibly afford.

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Cool Ways to Design Circuits—Part 4

This month we put it all together in the exciting conclusion to rolling your own printed circuit boards. If you've been paying attention, you can produce professional quality printed circuits in onsie-twosie lots, or by the dozen, with only a very modest investment in software and hardware. See Figure-1 for examples that were produced with the DynaArt Designs Toner Transfer System.

Review my last three columns for gory details of the software, procedures, and an overview of the Toner Transfer System. With no further ado, let's do it.

■ Toner-Transfer System

The Toner Transfer System is a process whereby you print a 1:1 mirror image of your design on specially treated TTS paper with (preferably) a laser printer and, by heat and pressure, transfer the printed image from the paper to the copper surface of the circuit board. When the water soluble coating on the paper is dissolved, the paper is released from the toner image which remains adhered to the copper. The circuit board is then ready for etching!

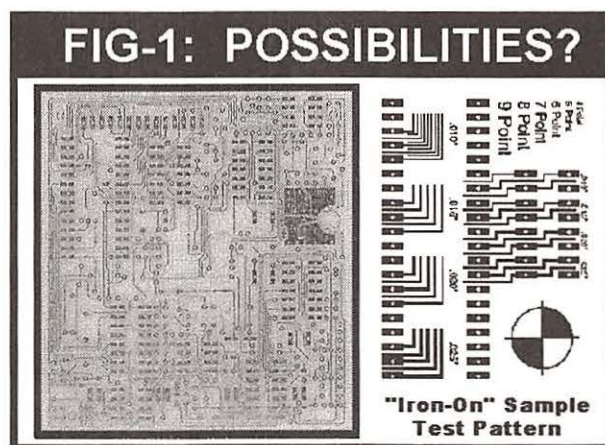
The toner, if properly transferred, adheres to the copper, in a reverse mirror (normal) image, thereby preventing the etchant solution from removing the copper wherever the toner exists. Simple enough concept.

Toner Properties: The toner powder used in laser printers and most copiers is a sophisticated mixture of plastics and carbon. Under the right heat, the toner melts and adheres like glue to surfaces after it solidifies. Melted toner sticks best to rough surfaces (paper) and less so to smooth surfaces. This is why the printed mirror image has to be on specially coated paper.

Soaked in water after the heat and pressure step, the coating on the paper dissolves, and the paper floats away leaving the toner image on the copper board. Adhesion is enhanced if the copper surface is first roughed with #320-#600 wet emery cloth.

■ The Process

Printed Images: I said the printout of your design was best done with a laser printer, but if you don't mind an extra step or two, you can use an ink-jet or even a dot-matrix printer.



The important thing is that your blacks be black and your whites, white. If you use a dot matrix printer, you may need to touch up the image with a black felt-tip pen to ensure solid blacks. Then, make a copy of your printout on the TTS paper with a xerographic type of copier that uses plain dry toner (most copiers are of this type now). Your final product before the transfer must be a toner-based image on TTS paper.

The TTS Paper: There are at least three different papers that can be used in a toner transfer process, but only one works to a consistently high quality. The least satisfactory of the bunch is a translucent film called TEC-200. I never could get 100% of my images transferred to the copper board—bits and pieces of the toner always remained stuck to the film, so I quit in frustration.

The next—which I have not tested—is called PnP Blue; it's also translucent with an opaque blue film and a powdery texture. You iron it onto the copper board and peel it off, like TEC-200. The blue film comes off, leaving the toner on the board. Some people on the Usenet newsgroups claim PnP Blue works fine. However, I saw complaints about it, too.

My choice is the special coated (TTS) paper from DynaArt Designs. TTS is expensive, as are the TEC-200 and PnP Blue papers, but it is much less error prone, and there are ways to economically stretch it to the max, as follows:

See Figure 2. Print your design in the upper left corner of a regular sheet of 8-1/2" x 11" paper. You have to print several times to regular paper, anyway, in order to adjust the size of your circuit to 1:1 proportions. When you are satisfied with the size and quality, then cut a piece of TTS paper slightly larger than the actual design and tape it by its upper edge over the proof print. Manually feed the paper back into your printer, and print it one more time so that the design is printed on the pre-cut TTS paper. That way, you don't have to use a whole sheet of expensive paper; a little can go a long way. Then, carefully remove the TTS paper from the larger sheet of regular paper.

Preparing the Board: Use fine steel wool or an abrasive pad to polish the copper surface of the board until it is bright and shiny, almost mirror-like. Then wet a piece of #320-#600 emery cloth and thoroughly roughen the copper surface with circular motion. When the surface has been uniformly dulled/roughened, thoroughly rinse the board under running water for a minute or so. Then lay it between layers of clean paper or cotton towels to blot the moisture from it. Lay it aside.

Preparing the TTS Image: You don't

FIG-2: MAKING TTS PAPER LAST

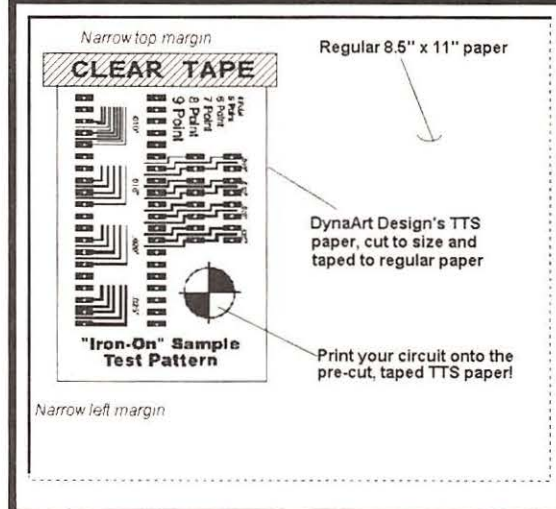
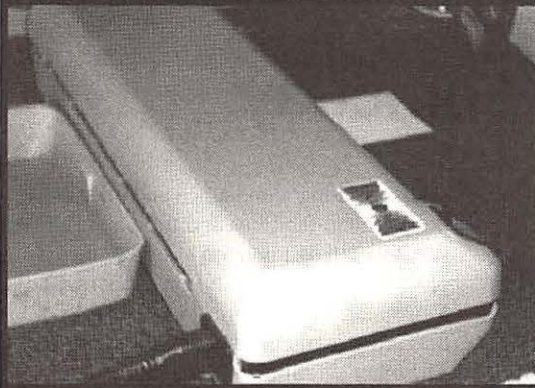


FIG-3: DynaArt Designs SUPERFUSER



A 2" x 3" circuit board is inserted into the front of the SuperFuser. A few minutes later it comes out the back and drops into a water tray.

have to take this extra step, but it can add a measure of quality. "Bakerize" the image by directing a flow of extremely hot air onto the back side of the TTS paper—hot enough to char the paper if held too long is about right! I use a heat shrinking gun, but a blow torch held at some distance may work.

"Bakerizing" is a term coined, I think, by Don Lancaster, to define a process of remelting toner-based images on paper to make them sharper and blacker. This process also removes all moisture from the paper and preshrinks it before it is heat-pressed onto the copper board.

In any event, if you can direct a source of hot air onto the back side of the TTS paper so that the paper just begins to turn a very light tan, this will melt the toner on the opposite side and cause it to more evenly spread onto the TTS paper than the print or copy process alone.

Transferring the Image: Lay the TTS paper, image side down, onto the copper surface of the board. Fire up a steam iron (without the steam!) to its highest setting. After it has heated, lay the iron onto the paper and press downward with a firm, unmoving pressure. You may have to experiment, but 20-lbs or so of pressure seems about right. Hold this position for one to two minutes.

When you remove the iron, the TTS paper should remain flat and apparently stuck to the copper board. Do NOT remove the paper or even attempt to dislodge it. Instead, gently immerse the board into a bowl of water and let it sit until the paper floats away—about 1-2 mins. The toner image should be 100% adhered to the copper with none left on the paper. If some of the toner floats

away or is not stuck to the copper, you can fill in these areas with a Sharpie™ PCB resist pen.

Etching the Board: At this point, you're pretty much on your own. The Toner Transfer System process is done. I strongly recommend you use ammonium persulfate or sodium persulfate instead of the more common ferric chloride. But whatever it takes to etch the board is the next step: Go for it.

Hints - Tips - Kinks: The Toner Transfer System works best on 1/4-oz or 1/2-oz PC board (most board stock is 1-oz rated, which dissipates heat a little too fast for good adhesion of the toner.) Other heat/pressure systems may work better than an iron. A smooth surface of thick steel plate laid on the TTS paper/copper and heated in an oven to 400° for several minutes might work. A super-clean, roughened board with uniform pressure and heat on the TTS paper are the keys to a good transfer of the toner image.

■ Going Professional

DynaArt Designs can make life even easier for the dedicated homebrewer and professional prototyper. First in honorable mention is their SuperFuser (Figure 3)—an ingenious machine with heaters and pressure rollers into which you insert the PC board and TTS paper. Emerging out the other side, it drops into a tub of water for perfect transfers every time.

Their WaveMaster Zero Force Etching System (Figure 4) is a self-contained system of tank, fluid heaters, pumps, and dry acrylic platform on which the board to be etched is laid. Turn the pumps on, and the board is continuously washed by the etchant fluid until the pumps are stopped. Then the etchant

drains back into the bottom of the tank leaving the board dry and easily retrieved—a very safe and functional PCB etching system!

The economical SuperFuser and WaveMaster can repay their cost with profit to spare on the very first prototype job. The cost is modest for the near-production quality that can be achieved by the hobby or pro "desktop engineer." For more information on the Toner Transfer System, contact:

DynaArt Designs

3535 Stillmeadow Lane
Lancaster, CA 93536-6624
Voice: (805) 943-4746 (9am-6pm, PST)
FAX: (805) 943-3776
E-mail: dynaart@netport.com
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■ Computer Upgrade Update

Nov 95 to Feb 96 columns featured a series on upgrading and rolling your own personal computer. 486 motherboards were emphasized for the sake of low cost and simplicity. But technology waits for no man or woman. Times are changing.

American Microdevices (AMD) has brought to market their 5K86 series of Pentium compatible CPUs, and they are loaded for bear with good prices! If you know a little of what you're doing, it may make economic and technical sense to upgrade your aging 386 or 486 to AMD's 5K86/P-75 or 5K86/P-90.

The main caveat is that you *must* use a 5K86 compatible motherboard, of which a number have been tested and approved now. Check with your dealer. I just built a real "TurboWhopper" with a BioStar MB-8500TAC motherboard and is that board ever sweet! Built into the MB-8500TAC are primary and secondary IDE ports for up to four hard drives and CD-ROMs; up to four floppy drives; two high speed 16550 UART serial/com ports; one bi-directional parallel port; a PS/2 mouse, and an infrared port! The only required add-on is a video controller card of choice, preferably PCI-bus.

Street prices for the BioStar board should be less than \$140 and the 5K86 CPU at around \$100. Add a \$100 PCI video card and you might be all set with a bargain screamer if you can salvage RAM, keyboard, mouse, monitor, and disk drives from an older machine. (I just retired the last of my 386 computers, and maybe so should you!)

Other ways to contact Bill Cheek:

BBS & FAX: 5:30-1:30 p.m. PDT: 619-578-9247
CompuServe: 74107,1176;
World Wide Web: <http://ourworld.compuServe.com/homepages/bcheek>;
FTP: <ftp://ftp.cts.com/pub/bcheek>

FIG-4: DynaArt Designs WaveMaster



The WaveMaster is a safe and portable PCB etching system that comes with quality pumps, heaters, and protected electrical wiring.

GPS Accuracy? Maybe Someday

It is widely reported that the Global Positioning System, (which, of course, guides commercial airliners and emergency vehicles and is centrally involved in other crucial services), is being sabotaged by its creator, the U. S. Defense Department. The reports allege that the Pentagon is intentionally degrading the accuracy of GPS signals received by other users in order to achieve strategic superiority.

The Rand Corporation, commissioned by the Clinton administration to study the effects of intentional military degradation of GPS, urges that the \$10 billion global navigation system be fully released by the government and allowed to be the world's standard.

However, the President will allow the Pentagon to continue degrading GPS while new technology is developed to maintain military superiority, according to both the Associated Press and the *Wall Street Journal*. This takes on special significance in light of Rand's projection that the satellite-navigation industry will grow from \$1 billion to \$8.5 billion in revenues by the end of this century. Restoring the system's accuracy would also help relieve foreign skepticism of the precision and long-term availability of GPS, says one industry spokesman.

The Associated Press predicts that the Pentagon in its own good time will fully release GPS and give the general public a far more accurate system than exists today for use in aircraft, cars, trucks, trains, and emergency vehicles.

■ Golfers – your game is looking up!

Imagine driving your golf cart up to your ball on the fairway and reading distance to green, along with hazards to avoid and caddy-like tips for the next shot, on an in-cart display screen via GPS satellite links. It's coming soon to a golf course near you.

The California-based Trimble Corporation and ProShot, Inc., announced at the 1996 PGA Merchandise Show that they have formed a strategic partnership to develop GPS applications for the golf industry. Trimble has the GPS technology that ProShot needs for its patented OmniGolf system. OmniGolf includes three separate components:



- A computer system with in-cart LCD display that measures distance from cart to green and apprises golfers of hazards and tips for the upcoming hole;

- A cart-tracking system in the clubhouse monitoring the position and progress of all carts on the course;

- And a communications link for relaying messages from the clubhouse and the cart's display screen.

"Not only will the system provide beneficial information to its users, but it will put GPS into the hands of many consumers who may have only heard about (wireless) technology," says William Bone, chairman of ProShot Golf.

■ New speeds attained in data transmission

The INTELSAT company recently tested live, digital, two-way transmissions at the unprecedented rate of 155 million bits per second. In computer language, it typically takes eight bits to form a character of the alphabet. Assuming an average of five characters per word, the transmission speed attained in this test equates to about four million words per second. This new increased transmission rate promises to blaze a trail for a number of new satellite-based services including wideband data networking, improved video applications, and super-computer links.

■ Satellite phone system to be launched

Hughes Space and Communications International, Inc., has announced that it will build a satellite-based mobile phone system for Asian users. The system will include two

satellites along with launch and mission support, ground facilities and training. The first satellite will handle 16,000 simultaneous duplex (two-way) circuits for users in China, Singapore, Japan, Korea, Southeast Asia, India, Indonesia, Pakistan and the Philippines. The other satellite will be used as a spare.

The new system will support handheld telephones, fixed land-based phones, and mobile phones for land, sea, and air.

Hughes is to provide five gateway stations in China, Singapore, and Thailand. The company will also provide a satellite control facility and a network control center. Additional gateways are to be added as service expands in the region.

■ Wireless power transmission?!

There are rumblings deep in the bowels of corporate and government secrecy of a mind-boggling new technology that could replace high-voltage power lines with *wireless* electrical power transmission.

One of the giants in the oil industry reportedly has patented technology that could beam electrical power, without wires, from power generation plants in oil and gas fields directly to consumers.

The technology has been linked to the U.S. government's controversial High Frequency Active Auroral Research Program (HAARP) being developed at a DOD-owned site near Gakona, Alaska. This is a major facility for doing upper atmospheric and solar-terrestrial research, say government officials. It is scheduled for completion in the year 2002. When fully implemented, the facility will beam megawatts (and ultimately gigawatts) of HF radio frequency power into the sky to manipulate the ionosphere for purposes of scientific research and (some say) exploitation. DOD involvement suggests that HAARP has military uses as well.

According to controversial reports, this ability to transmit millions or perhaps billions of watts with precise accuracy to distant targets like radio signals could have lucrative commercial purposes such as sending electrical power without wires from generators to customers.

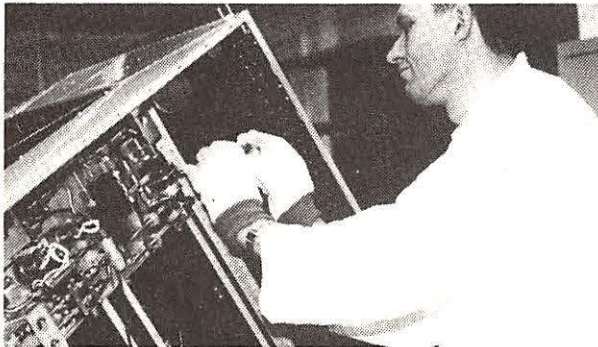
Researchers monitoring the HAARP project say they have found corporate patents on a wireless system for transmitting electrical power.

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Computer Predictions and Buckmaster CD-ROMS

As promised, this month we will look at two CD-ROMs from Buckmaster: HAMCALL and Electronic Software Compendium (ESC). But first let's do some computer industry intelligence snooping.

■ What's happening out there?

The semiconductor manufacturers, who make the chips which go into our PCs, have reported a downturn in business three months running. The almighty "Book to Bill" ratio which every semiconductor executive lives by, indicates how many new orders were received for every order shipped. A ratio of 1.0 shows a constant market need. Less than 1.0 indicates new business is in a decline.

The Book to Bill has fallen below 1.0 for the last three months to the lowest it has been in many years. This has a lot of industry people worried and has been explained as the result of poorer-than-expected Christmas PC sales, which has continued through the beginning of 1996. The RF wireless market is beginning to grow at a high rate. It is expected (i.e., hoped) to fill the gap left by lower-than-predicted PC chip sales.

The production capacity for DRAMs (PC memory chips) is now estimated at four times the current market need. This means memory prices should continue to drift down for a while longer.

Look out below! CD-ROM drive prices are falling fast. 4X internal drives are now at the \$70 mark! Another curious price drop is that of blank 1.4 Meg, 3-1/2 inch floppies. First the major manufacturers brought the price of formatted blanks down to that of unformatted—a drop of 30%. Now most of the manufacturers are offering heavy rebates, up to 50%, on these prices.

Modem prices are playing musical chairs. With 14.4 modems being phased out by manufacturers, they can be had for around \$40. 28.8 modems will become the standard by the end of 1996.

CRYSTAL BALLING

Looking forward, I believe that by the end of 1996 new CD-ROM drives with speeds approaching hard drives will become available. Also, I predict a new high density (maybe as high as 20 Meg) floppy drive and floppy will become the standard.

```
File Search Options Help=F1
WA4PYQ Grove Robert B Brasstown 1/1

Call Sign: WA4PYQ
Class: Advanced
Exp. Date: 12-17-1995
Birth Date: 02-23-1938

Name: Robert B Grove
Street: POB 98
City/State/ZIP: Brasstown, NC 28902
County: Clay

suffix.PYQ
first.Robert last.Grove
city.Brasstown state.NC zip.28902 county.Clay
1:H A M C A L L:grove & brasstown

Next Item=TAB; Previous Item=SHIFT-TAB; Toggle Text=CTL-T; Space=SEARCH
```

FIGURE 1: HAM program search screen results. Who is this guy??

Watch for 28.8 modems to really drop in price by the end of 1996 to give-away levels as they become as common as I/O controller cards, modem speeds keep increasing, and new modes of telecommunications start hitting the market. If they can sell a complete electronic telephone for under \$15 what do you think mass production will do to the cost of a 28.8 modem?

Not happy with just "Intel Inside," watch for Intel to start producing more than just chips. Intel "On the Outside" may be their new slogan for complete computer systems.

■ HAMCALL

Buckmaster produces two radio-related CD-ROMs: HAMCALL and The Electronics Software Compendium. Both can be used in a DOS, Windows, or even MAC environment. Running any program on HAMCALL is very simple via the MENU program.

Although primarily a program to locate and cross-reference ham radio operator information, HAMCALL does more and has some unique features. Using the program ICALL, a ham operator's name, address, birth date, license class, and date of issue can be displayed by entering his or her call sign. (I'd like to direct you to a picture of this screen but none of the screen capture programs I have would do the job.) Compared to similar programs I have used, there is more information

displayed in ICALL, such as the previously held license call and date, the telephone number area code, the operator's time zone and county (for contest information). Even more useful, in my opinion, is the exact longitude and latitude of the station, with claimed accuracies "to within a few hundred feet." Pretty nifty.

A nice feature is the opportunity to view a photo of the operator. I found a very small number of pictures (in the hundreds) currently available, since this requires hams to sent their pictures to Buckmaster. However, if the FCC (or whatever they are called in the future) someday requires a photo, as most driving licenses do, Buckmaster will be ready.

TIMING IS EVERYTHING

How long does it take to retrieve information using the ICALL program? Good question. Keep in mind that over 1,250,000 call signs, including all the US hams and an "extensive" number of international hams in over 120 countries are on the CD. Would you believe that I measured the average search time to be approximately three seconds using a 486 DX2 33 Mhz and a 2X CD-ROM drive? Nobody can complain about that!

Although the CD-ROM is a read-only device (for now—but that's for a future prediction column), you can modify its data. Buckmaster has provided for user modifica-

tion of information by writing new info to a file on the hard drive and polling this new info during a search. For a relatively small number of modifications I think this is a great idea. But as the number of modifications grow, so will the fast, three second access time.

MORE IS BETTER

In addition to ICALL there is a program called HAM from which you can search, by word, on any of the listed parameters, not just the call sign. See Figure 1. This takes a bit more time and requires a bit more database skill. But it is very useful in larger searches, such as setting out to find all the hams in your town.

Also included on HAMCALL are over 160 radio related programs and over 1000 text files dealing with everything from all facets of the ARRL (Amateur Radio Relay League) and its magazine *QST* to equipment modifications. Any ham, or radio enthusiast, will be interested in many of these files and programs.

OVERALL IMPRESSION OF HAMCALL

Very comprehensive for hams. Very easy to use. Almost a must for the serious ham. But, at \$50 (plus \$5 shipping) a little expensive for the radio monitors among us.

■ Electronic Software Compendium (ESC)

Over 25,000 files are contained on this CD, which is also menu driven. About 1900 are compressed ZIP program files. Most, if not all of the ARRL and ham files from HAMCALL are on ESC. All files on ESC are easily downloaded to hard disk via a main menu screen. Unfortunately, there is no capability to view text files within ZIP files without first unzipping and downloading. However, a text file reader is provided for non-ZIP text files.

Where do we start to summarize over 1900 programs?! The topics covered include: equipment modifications, frequency lists, antenna construction, computer-radio control programs, utility stations info, digital modes decoding programs (WEFAX, RTTY, slow scan TV, etc), propagation programs, distance-direction, scanner/swl/ham databases, logging programs, astronomy, circuit simulators, greyline/sunrise/sunset, frequency charts, circuit design, cad, printed circuit board layouts, satellite tracking, electronic formulas, ac/dc circuit tutorials, computer graphic applications, Morse code trainers, ham exams word processors, spreadsheets, programming, and lots of ARRL/FCC info! Most programs are less than three years old; many

are less than two years old. A large number also reside on various other radio CD-ROMs.

■ Is it all there?

I found at least one ZIP program, Bear101.zip, that would not download to my hard drive using ESC's main menu. No error message was displayed. It just sat there when I hit the enter key to start the download. Nothing.

Upon further investigation I found that the program did exist on the CD. Using the DOS copy command I was able to transfer the Bear101.zip file to my hard drive and manually unzip it without a problem. The result is a fully working program which translates desired frequencies into programming front panel switch settings for a circa 1976 scanner.

(Yep, it wasn't too long ago [1976] that this was considered a state of the art, high tech scanner. Having purchased it recently at a flea market I was truly interested in downloading the Bear101.zip program.) This may have been an isolated incident. But if you run into the same problem, try the manual copy/unzip approach.

The collection is impressive, with something for everyone who is interested in the radio hobby. Quite frankly, at \$25 (plus \$5 shipping), if the ham operator info is not important to you, ESC is the better deal—in fact a very good buy, and recommended.

Both of these CD-ROMs are updated twice a year, in April and October, and are available from Buckmaster Publishing, Route 4, Box 1630, Mineral, VA 23117 Tel (800) 282-

5626, Internet info@buck.com.

■ Coming Up

I've been using new versions of AEA's Log Windows and PC PakRatt for Windows for a few weeks. What's the difference from their old versions? How do the new functions work? And what about this new computer card full spectrum DSP receiver? Is it real? Is it available? How well does it work? Next time we'll answer these, and many more questions

HamCall™ US & International CD-ROM- Over 1,250,000 Listings

ICALL for DOS and Windows now allows EDITING! Data displayed for U.S. hams: call sign, class, name, address, issue date, expiration date, birth date, license class, county, lat/long, area code, time zone, grid square, previous call and class, hours past GMT.

New editing feature allows you to add new records, change addresses, add e-mail address, or add phone numbers. View photos/QSLs of many hams.

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Price remains \$50.00 plus shipping; \$5.00 U.S., \$8.00 International.

Electronics Software Compendium™

The Electronics Software Compendium is a collection of shareware programs and data files that pertain to electronics, broadcasting, amateur radio and SWL activity. Over 25,000 files in total. The disc is updated and issued annually in April. Over 300 megabytes of PC and 50 MB for MAC. Send for your new edition today! The price is still only \$25.00 plus shipping; \$5.00 U.S., \$8.00 International.

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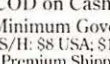
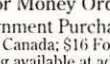
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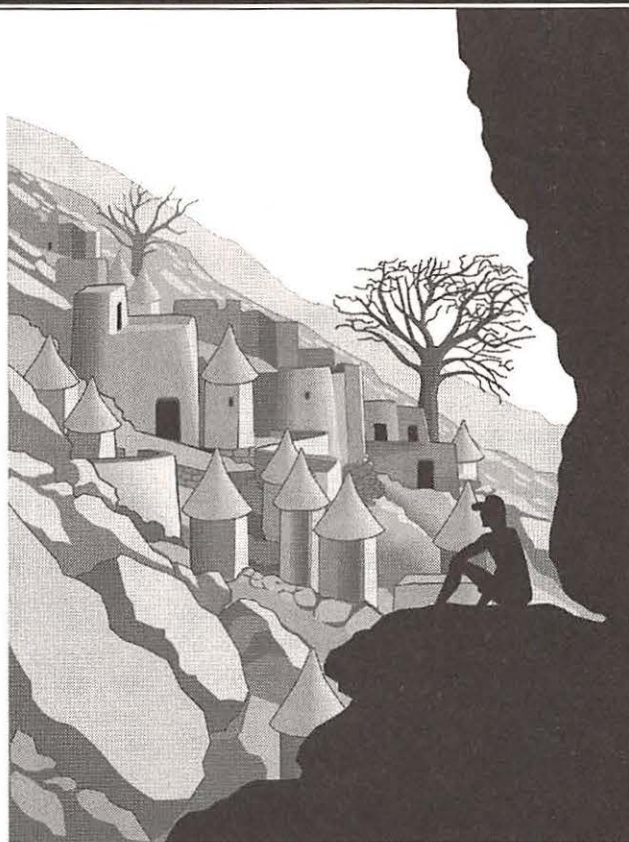
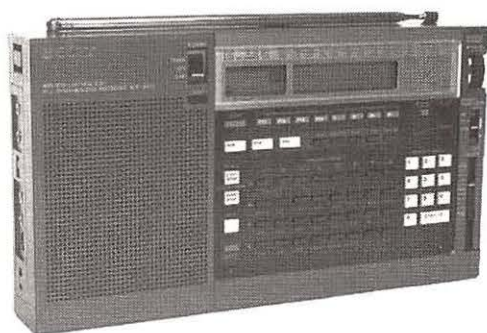
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WHAT'S NEW?

PRODUCTS AND BOOKS OF INTEREST TO THE RADIO HOBBYIST

by Larry Miller

Guest reviewers: Bob Grove, Haskell Moore

New Receivers Announced

The Dayton Hamvention was an eye opener for many short-wave listeners. Drake announced their impending SW1 receiver and ICOM introduced their luxurious R8500.



The Drake SW1 is a high quality, bare bones, AM only, listener's set which has continuous frequency coverage from 100 kHz through 30 MHz, tunable in 1 kHz increments. It comes preprogrammed with 32 memorized frequencies for the popular boomers like the BBC, Radio Moscow, VOA, and so on.

A bright LED shows the selected frequency, and the radio may be operated from AC or DC power. Drake targets the new listener with this straightforward receiver, but adds that it does not compromise sensitivity, selectivity, or dynamic range.



The other side of the coin is ICOM's exciting, new R8500 which tunes from 100 kHz continuously through 2000 MHz (less cellular). Using technology developed for their previous R9000, R71A, R7000, and R7100, it is a serious, all-mode receiver with 10 Hz steps, adjustable selectivity, and a price to match.

While neither company had firm pricing at Dayton, the Drake SW1 is expected to sell for about \$300, and the ICOM R8500 for about \$2000.

— BG

The Ultimate Interceptor

It appears to be the "mother of all scanning accessories." Optoelectronics has begun running ads for their Xplorer. According to the ads, the Xplorer is a near-field communications receiver that can "hear it, see it, decode it, map it and record it." It sweeps 30 MHz to 2 GHz in less than a second. The two-line character LCD displays frequency and either All Mode Decoding (CTCSS, DCS, DTMF), LTR-Trunking, Relative Sign Strength, Latitude and Longitude, or FM Deviation. It even has an NMEA-0183 GPS interface to tag and map the transmitter you discover. Over 500 frequencies can be memorized including time, date and latitude and longitude information.

You'll no doubt be hearing more about the Opto Xplorer in coming weeks. For more details, contact Optoelectronics at their Ft. Lauderdale factory at 954-771-2050 or write 5821 NE 14th Avenue, Ft. Lauderdale, FL 33334. The retail price of the Xplorer is scheduled at \$899.00.



Nightlogger II

The Nightlogger has its roots a decade or more ago in the old SCAN club, the precursor to today's *National Scanning*. SCAN founder and president, the late Bob Hansen, was looking for a device that would allow scanner listeners to keep tabs on things even when they were asleep or away from the radio.

Dave Wyatt of Benjamin Michael Industries came up with

the solution and called it The Nightlogger.

The Nightlogger was, simply, a tape recorder activator. You plugged it into your scanner and your tape recorder. Whenever there was audio present on the scanner, the Nightlogger turned on the tape recorder. When the audio stopped, the Nightlogger turned off the tape recorder. In the morning or when you came back, you rewound the tape and listened to a seamless recording of everything that went on during your absence.

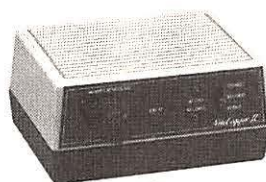
I'm not sure what happened to the Nightlogger but it seemed to disappear. In its place, another firm offered the HTS-2, an amplified speaker that, kind of as an afterthought, also contained a tape trigger device.

Recently, we received a press release from Benjamin Michael Industries announcing the arrival of Nightlogger II. The thing that Nightlogger II has over the HTS 2 or 3 is that it is a dedicated tape unit. It isn't something else with the tape trigger thrown in. It's well thought out and designed specifically for scanner listeners (and, I guess, shortwave listeners, too).

Like the original, Nightlogger II will turn your tape recorder on when audio is present on the scanner and off when the audio goes off.

Nightlogger II provides a speaker so that the user can hear what is happening on the channel when you are recording. A volume control is also included for silent recording if desired. You can control how quickly the Nightlogger responds to audio and you can bypass the unit without having to disconnect it.

You get everything you need



here — all cables and a wall charger-type power supply.

After complaining mightily about the shortcoming of the HTS-2 and 3 for auto tape recording, it's nice to see a well-thought out device like the Nightlogger II. Nightlogger II is \$69.95 and can be ordered from Grove Enterprises at 800-438-8155.

Genesys G-1

It's really a ham antenna but Bob Grove was so impressed with its construction and performance in the aeronautical and land mobile bands that the Genesys G-1 antenna has found its way into the Grove catalog.

This is an extremely rugged antenna designed for permanent professional base installations. Essentially a dual-bander (144-148/440-450), it's also compact, measuring only 43 inches.

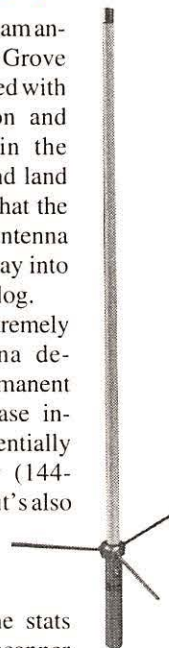
Here are the stats that matter for scanner listeners: The Genesys G-1 covers 118 to 960 MHz and provides 3 dB gain in the 144-174 MHz range and 6 dB gain from 406 to 470 MHz.

Of course, you can also transmit on it as well with up to 120 watts of power at 50 ohms. It uses an SO-239 (UHF) female connector.

The price for the Genesys G-1 is \$89.95 plus \$8.00 UPS. To order, call Grove at 800-438-8155.

AM Ear

If you're looking for an AM radio with good sensitivity and small size, you might want to try the new AM Sounds "ear radio." According to a press release from the manufacturer, American Technology Corporation, the AM



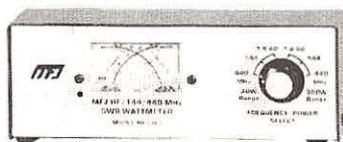
Sounds ear radio is so small that it literally fits in your ear. There are no earphones, nor wires, and no bulky receiver unit to hang from your belt. According to ATC president Robert Putnam, "While fitting comfortably in the ear one can listen to a favorite talk or sports program, leaving the other ear open to conversation, room sounds, traffic, etc."

OK. So you want to know the obvious. How does this sucker stack up as a DX machine? Well, Putnam says that it has 100 microvolt sensitivity. "Translated in common terms," he says, "this means our radio picks up stations that other pocket and portables might miss altogether."

So there you have it. No more missing an opportunity for rare reception because of the fact that DXing is considered socially unacceptable at church, school, or work. Now you can AM DX anywhere, anytime. Just dig your finger into your ear and spin that dial.

AM Sounds is available for \$29.95. You can order by calling the company at 800-41-RADIO. Tell them that *Monitoring Times* sent you.

Cross-Needle Watt Meter



The new MFJ Cross-Needle SWR Wattmeter covers 1.8 to 60 MHz, 144 MHz, and the 440 MHz Bands on HF, VHF, and UHF.

You can read forward and reflected power and SWR simultaneously at a single glance with the MFJ-864. It features separate HF and VHF/UHF directional couples, each with its own set of SO-239 coaxial connectors.

You also get two power ranges — 30/300 watts forward and 6/60 watts reflected. Each power range for each band is individually calibrated and Schottky diodes are used for maximum accuracy. A single knob and lighted meter makes the whole thing easy to use.

You can get your MFJ-864 at your favorite ham store or direct

from the manufacturer at 800-647-1800. Or write to MFJ at P.O. Box 494, Mississippi State, MS 39762.

Ham Logging Software

M*LOG is a general purpose radio log-keeping system for DOS-based PCs. Standard features of M*LOG are automatic country look-up, unlimited QSO data including six individual fields. QSL data can be printed directly on cards or labels or saved in a file in WordPerfect Merge or delimited ASCII text format.

The new version, 3.2, adds the ability to report in callsign suffix order and more.

M*LOG is competitively priced at \$34.95 plus \$5.00 shipping. The upgrade version of 3.2 is \$18.00 postpaid for registered users of previous versions.

For more information or to order, call Milestone Technologies at 303-752-3382 or write 3140 S. Peoria St., Unit K-156, Aurora, CO 80014-3155.

Pirate Radio Directory

The Voice of the Daleks proposes to destroy the human race. The Crooked Man is thought by many to be the most bizarre radio broadcaster ever. And KDED broadcast content is devoted solely to the Grateful Dead.

These are just three of the 125-odd (and we do mean odd) pirate radio stations that are featured in the new, 1996 edition of the *Pirate Radio Directory*.

This popular annual publication covers all known shortwave pirate activity for the previous year, listing program formats, disc jockeys, frequencies, times, verification procedures, and



more. Written by Andrew Yoder, it's an extensive look at the pirate radio scene and how to hear them.

An appendix lists all stations and the times and frequencies of their broadcasts over the past year. It's always a good read, although reading this year's edition took some extra effort — the pages were out of order. (But that lent an authentic "pirate" flavor to the book.)

You can get your copy of *Pirate Radio Directory* from Tiare for \$12.95 plus \$3.00 shipping. Call them at 414-248-4845 or write Box 493, Lake Geneva, WI 53147. Tell Gerry we said, "hi!"

Clandestine List

Clandestine stations are the political side of the unauthorized radio spectrum. And it's an area of radio that changes very quickly.

Finn Krone has updated the Danish Shortwave Clubs International's *Clandestine Stations* list and is offering copies for sale.

It contains the latest available data on all active clandestine stations broadcasting on shortwave, including transmission schedule, political organization, language, addresses and verification policy.

The stations are listed in frequency order as well as in time and country order. There's also a fair amount of background information.

The list isn't big — it's just 28 pages — but it gets the job done in admirable fashion.

You can get a copy by sending 10 IRCs (you buy them at the post office) to Danish Shortwave Clubs International, c/o Bent Nielsen, Egekrogen 14, DK-3500 Værløse, Denmark.

Crystal Sets

One of the most sought-after prizes in the radio flea market is the crystal radio, a nostalgic vestige of a simpler time when a long wire and a chunk of galena

had the magical quality of bringing human voices from great distances. The allure is still there, and it can still be done; Philip N. Anderson tells us how to do it.



This series of booklets on "Crystal Sets" (we are reviewing number 5) is a compilation of newsletters and correspondence of The Xtal Set Society. Each of these booklets concentrates on various subjects; this latest, in its 88 pages, addresses impedance measurements in choosing crystal material, building a loop antenna into a headset the old way, detecting whistlers, ground-powered crystal sets, and even a delightful anecdote about how a dog improved a ground (use your imagination).

All of these series are enjoyable and easy to read, and the price is right at \$9.95 plus \$2.50 book rate shipping. Send to The Xtal Set Society, PO Box 3026, St. Louis, MO 63130; ph. 314-725-1172.

—BG

Building Your Own Box

Working on a project and looking to finish it off with a special cabinet? SESCOM, Inc. has released their 1996 Constructor's Hardware catalog.

The catalog is filled with new and innovative electronics packaging solutions and hard-to-find items.

You'll find an expanded sheet metal line that's gone from three basic aluminum boxes to nine pretty sharp-looking styles. These Box-It enclosures feature flat panels for easy punching and are assembled with extruding rails that extend to the end of the boxes. They're a light gauge 0.040 inches, perfect for those small, inexpensive projects.

(Continued on p. 96)

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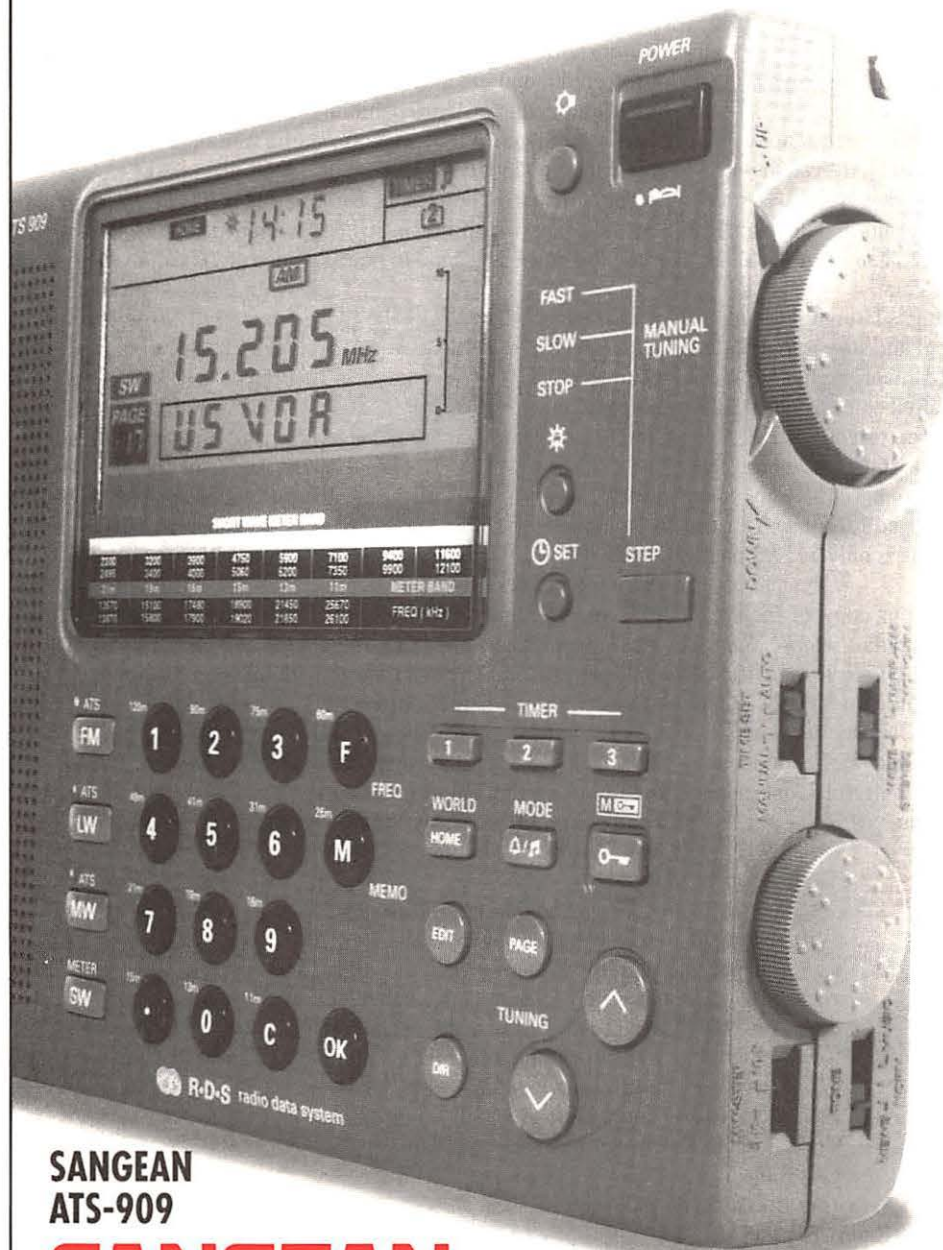
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S - Y - S! Save Your Scanner!

When I get in the car, I tend to bring a lot of scanning stuff with me. Two handhelds (I just don't see the purpose of a dedicated mobile), frequency counter, extra battery packs, various antennas, usually a frequency list, a pad and pen for writing down new discoveries, and a one pound bag of Skittles candy. All of this goes on the seat alongside of me and all of it usually ends up on the floor as soon as I turn out of the driveway.

I was mentioning my dilemma to fellow columnist and frequency freak Larry Van Horn when he directed me to the company catalog. "Page 32," he said, "is what you need." A couple of days later a brown Grove box arrived on the doorstep. Inside was the Deluxe Mobile Organizer for handheld radios.

The Deluxe Mobile Organizer for Handheld Radios features two fully-adjustable, locking holders for your scanners, plus a handy organizer for pen and pad, plus space for spare change and my Skittles.



The whole thing sits on my seat beside me, looking quite handsome in charcoal grey.

Considering the slamming my scanners take every time they hit the floor when I turn the corner, the \$14.95 is a wise investment. You can get your Deluxe Mobile Organizer for Handheld Radios from Grove by

Of course there are larger sizes, all of which you can check out as soon as the catalog arrives in your mailbox. It's free of charge

calling 1-800-438-8155. And tell them I said thanks!

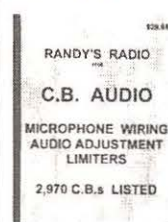
Pocket Connecticut

The *Official Connecticut Public Safety Frequency Guide* is now out in a revised pocket size. Keith Victor and co-editor John Bolduc have packed 3,922 frequencies, 35 pages of detailed system information, the new 800 MHz statewide mutual aid channel plan, PL tones and call signs into a handy 4" x 7" format.

Nothing is left out — fire, police, (local and state), sheriff, local government, highway maintenance, civil defense, aeronautical and even forestry. In all, it's 128 pages of hot numbers, all packed into a "slip it in your pocket and go" format. Best of all, the book is only \$12.95 post-paid.

Order your copy of the *Official Connecticut Public Safety Frequency Guide* from Official Scanner Guides at 800-351-7226 or send your check or money order to P.O. Box 525, Londonderry, NH 03053. Tell Bob Coburn that *MT* sent you.

CB Audio



Who maintains the citizens band radios for your local chapter of REACT? Intended for CB radiotechs, *CB Audio* is a

compilation of wiring diagrams by Randy's Radio for the vast majority of microphones and their mating connectors, by model name and number. The first nine pages contain pinout diagrams and wiring tables; the remaining 71 pages is an alphabetized list of nearly 300 CB radio models referring to the appropriate connec-

tor diagrams. Tell your local repairman the manual is only \$29.95 from Randy's CB Specialists, 13381 Foothill Blvd., Fontana, CA 92335; ph. 909-899-2587.

—BG

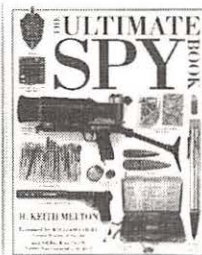
The Ultimate Spy Book

For more than a decade, Keith Melton's ads, looking for spy memorabilia, have peppered hobby radio and other special interest publications. I tried more than once to get him to write for *MT*, but to no avail; I didn't even get a reply to my phone calls. But the wait was worth it; *The Ultimate Spy Book* is second to none.

Richly illustrated with more than 600 color photos on glossy stock, its 176 pages reveal hundreds of "James Bond" devices, true spy accounts, and history-making espionage stories. Of special interest to *MT* readers is the chapter on clandestine communications, with suitcase radios, disguised and camouflaged communications equipment, ciphering equipment, spy cameras, microdots, and concealments. Neat stuff!

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The Ultimate Spy Book by H. Keith Melton is \$29.95 in hard cover from DK Publishing, 95



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—BG

TV History



Of all of the unusual things we get here at "What's New," one of the more unusual is the once-every-few-years appearance of the sample *TV Guide Specialists* catalog.

This is an 82 page booklet which lists all 2,240 weekly issues of *TV Guide* ever published. All are for sale, ranging in price from \$750 (issue #1 in 1953 features "Lucy's \$50,000,000 Baby") to a \$35 "Car 55 Where Are You?" Each listing tells you what the cover story was as well as some of the other stories — critical issues like, "How Dutch TV Smears America" and "The Proper Way to Watch TV." There are lots of cover pictures, too, featuring long gone, long dead, TV stars and shows. The whole thing is really weird.

You can get a copy of the catalog for \$4.95 from Jeff Kadet, Box 20, Macomb, IL 61455.

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The July-August Grove catalog is now in production, featuring the exciting new ICOM R-8500 on the cover. If you are not on the Grove Enterprises mailing list, call for the free catalog at 1-800-438-8155. For our Internet customers, Grove is offering reduced prices and special package deals on scanners, receivers and accessories. Check out our new World Wide Web site: www.grove.net

Optoelectronics OS535

By Haskell Moore

In April of 1994, Optoelectronics introduced the OS456 computer interface for the Radio Shack PRO-2006 scanner. Scanner enthusiasts greeted the OS456 as one of the most innovative developments the hobby had seen in years. Finally, one of the very best scanners ever made could be controlled via computer.

However, just a few months later, Optoelectronics and scanning hobbyists alike received a very rude surprise when they found out that Radio Shack had decided to discontinue the PRO-2006! Fortunately, Radio Shack replaced it with 1,000 channel PRO-2035, which was later upgraded and renamed the PRO-2042.

The PRO-2042 boasted many advanced features such as automatic search and store, rotary tuning, 50 channel per second scan rate and an improved display. Since the OS456 had met with such success, Optoelectronics quickly decided to develop an interface for the PRO-2035/2042, dubbed the OS535. The OS535 is the functional equivalent of the OS456, along with a few interesting enhancements, which we'll cover later.

Having installed both the OS456 and the OS535, I must admit that the '535 is a bit more challenging. However, the instructions supplied with the OS535 are extremely detailed and every major step is covered in one of the fifteen supplied illustrations.

Two things immediately caused me concern as I read the installation instructions: removing the PC board from the scanner and nibbling a slot in the rear panel for the connectors. Despite the ominous sound of each of these operations, they turned out to be a lot less daunting than I had imagined. First, the PC board is simply held in place by a handful of screws and is connected to the other components of the scanner with plug-in connectors. Only two leads from the power transformer had to be unsoldered.

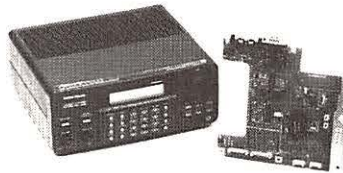
If anything, cutting a slot in the back of the scanner was the most challenging part of the installation. However, a nibbling tool described in the instructions (available at Radio Shack for about \$11) made the operation relatively simple.

Optoelectronics went to great lengths to describe this process in detail, and even supplies a self-adhesive template to ensure correct alignment. Despite my initial concerns, in only twenty minutes the process was complete and I had a perfectly neat hole that made for a very professional looking installation.

I learned from my installation of the OS456 that the connectors can be a bit difficult to disconnect and reconnect. But again, the installation manual provides very detailed instructions on the best way to work the connectors loose. When putting the connectors back together, I found that a small jeweler's screwdriver works great for seating each of the pins in the connector.

The only other challenge was threading a very fine wire through a hole in the PC board and soldering it in place. For those who are already hunkered over their radio and are at step 8.2 of the instructions, try this: enlarge the hole slightly with a needle, then thread the bare portion of the wire through and solder it to the resistor on same etching on the other side of the board.

Exactly two hours and thirty five minutes after I began, I did one last quick check of everything, then cautiously turned on the scanner.



The first good sign was that the scanner still functioned normally on its own. Since I had the Scanstar for Windows software on my computer for my OS456, I only had to configure the program to access the OS535. In less than five minutes after completing the installation, I was able to begin using the PRO-2035 with the new OS535 installed.

The Scanstar for Windows software allows one computer to control multiple computer-controlled scanners, so I fired up the PRO-2006 and used it side by side with the PRO-2035. They functioned almost identically, with the PRO2035/2042 showing a slight edge in performance.

The OS535 comes with a "checkout utility" program to verify proper operation of the product. In addition, there are several different demo versions of software included in the package.

■ Teasers

Now for some really intriguing tidbits! First, there is a jack on the rear connector panel (where the serial connector plugs in) for an NMEA interface—the same type used on Global Positioning System (GPS) receivers to interface with a computer. As of this writing, the NMEA interface is not yet operational. However, Optoelectronics has promised an upgrade which will be available in the future.

The logical conclusion is that this connector will be used to link a GPS, scanner, and laptop computer together in a comprehensive mobile scanning package. Then conceivably, when the scanner hits a new frequency in the search mode, the GPS would provide the position information and the software could then determine the closest transmitter for the given frequency.

Even more interesting is a socket on the OS535 labeled "Data Demodulator Daughter Board." Could this be a socket for a future trunking enhancement? Optoelectronics isn't talking, but there's a lot of speculation that it was provided as an avenue for a third-party vendor to provide trunking capability for the OS535. After all, if a totally separate vendor provided a trunking chip, neither company would have, in the strictest interpretation of the law, built a trunked receiver.

And speaking of things controversial, the OS535 board also has the ability to allow reception of the cellular telephone bands. This feature, which is activated by entering a password via certain software packages, is intended for "official use only." I noticed that the Scanstar for Windows package that I use has a place to enter the code, but since I'm not an "official" user, I was unable to test this feature.

If you are interested in state-of-the-art computer scanning, and are willing to spend an evening to achieve it, you should strongly consider the OS535 interface. Both the PRO-2035 and PRO-2042 are great receivers, and the OS535 serves to enhance the functionality of either considerably.

Optoelectronics can be reached at (800) 327-5912. The OS535 is also available from Grove Enterprises at (800) 438-8155 for \$299.95.

Sony's Value Offering: the ICF-SW40

Think of Japanese electronics, and you can't help but think of Sony. But times change, and we now find Sony products being made outside Japan—TVs in the United States, for example, or boom boxes in China. Yet, until recently all Sony's world band radios have been manufactured in Japan.

But this is beginning to evolve: The new Sony ICF-SW40 portable we've tested this month is made in Taiwan. A Sony spokesman tells me it's manufactured there by one of the several companies formally associated with Sony—not one of the established OEM firms like Sangean, which is the world's largest OEM manufacturer of shortwave portables.

Why? After all, Sangean makes a number of worthy radios for Radio Shack, Siemens, and others—as well as under its own name. But Sony prefers to stick to the Japanese tradition of using companies within its corporate "family," a group over which it has tight control. After all, when a company contracts an OEM manufacturer, its product usually winds up being the same as products offered by other manufacturers—except for the nameplate and perhaps a couple of features.

Of course, there are advantages to this, such as economies of scale. But there are also disadvantages.

For example, there are cases where large companies have done the research and development for a product, then assigned production to an independent manufacturer in a low-cost country. The manufacturer has then taken the design to make replicas of that same radio for other client firms. So the company that performed all the R&D winds up giving away its product identity and intellectual property to the offshore manufacturer—and, in turn, to competitors using that manufacturer.

■ Digital wolf in analog clothing

But there's more that's unusual about the SW40 than its country of manufacture and relationship to the manufacturer. It's also a digitally synthesized radio with digital frequency readout that's made to look like an analog radio. Yes, an *analog* radio, right down to a fake moving "needle"!

The idea, says Sony, is to make it comfort-



able for traditionalists accustomed to slide-rule-type dials. Whether this "make the automobile look like a carriage without a horse" approach is going to be a grabber in Cyberyland 1996, who knows? But with or without this feature, for many the SW40 is an excellent offering for the price, as we'll see. It lists for \$149.95, but the street price is more like a tempting \$129.95.

■ Covers many bands, but AM incomplete

The SW40 is a compact portable that covers longwave, AM, FM, and shortwave continuously from 3850-26100 kHz. FM is in stereo with headphones, but mono through the speaker, and it covers both the Japanese and traditional FM bands—a plus for travelers to Japan.

Longwave may seem like an odd offering. After all, there isn't a single longwave broadcasting station in the entire Western Hemisphere. But it can be useful if you're headed to Europe, North Africa, or Russia, where longwave excels because of its greater daytime reach than AM or FM.

But there's a catch with, of all things, AM-band coverage. It goes no higher than 1620 kHz, so it misses some of the extended AM band, which now goes to 1700 kHz in North America. I talked about this with a surprised Sony of America representative while he was on business in Japan, and at first blush it appears that this was an oversight, given that all other new models of Sony radios sold in North America have covered up to 1700 kHz

for the past four years, now.

For the time being, most people probably won't notice. After all, there are only two stations actually on the air between 1610-1700 kHz. This will be changing fast as the FCC authorizes more stations and the band fills up like a subway at rush hour. But this brief hiatus gives Sony a window of opportunity to increase AM-band frequency coverage in future production, should they care to do so.

■ Mixed bag of features

The SW40 may look like an analog radio, but for the most part it tunes like it's digital. Yes, there's the traditional tuning knob, but that's true on many worthy digital models, as well. For one thing, it has 20 presets, or memories, which you select by pushing a button, then spinning the tuning knob. For another, you can carousel upwards from one shortwave band to another simply by pressing the "SW" button. These tuning features are intuitive and simple to use, too, even though the tuning knob isn't very smooth.

But there's no free lunch. You can't have an analog radio with a keypad, and sure enough the SW40 maintains the analog illusion by having no keypad of any sort. For those of us who eat and breathe radio, this is clearly a drawback. No horseless carriages, thank you!

Another sore point for radio aficionados is that there's no single-sideband, much less synchronous selectable sideband. But the tuning knob has manually selectable tuning rates, which is handy for bandscanning. Shortwave, for example, tunes in either 1 or 5 kHz increments.

There's a 24-hour clock, too, as well as two "on" timers which automatically switch off after 60 minutes, making it something like a clock radio that can work twice each day. But when the timer switches on, the radio plays only the last-selected frequency, and it doesn't appear to be able to switch on any but a voice-activated tape recorder. There's also a sleep timer that shuts off the radio after 15, 30, or 60 minutes.

For travelers, there's a power lock to keep the radio from switching on accidentally. And there's a light for the LCD so you can see what

you're doing when it's dark, as well as a low-battery indicator.

■ Generally worthy performance, double conversion

The SW40 is just about the cheapest radio available with double conversion. This means that it's less inclined to produce image, or "ghost," signals than other radios in its price class. This is one area where it is clearly ahead of the comparably priced Grundig Yacht Boy 305, which has only single conversion.

Sony does this affordably by making the FM stage's 10.7 MHz IF do double-duty as the first IF for shortwave, and even longwave and AM; the usual 450 kHz serves as the second IF. It's a cute cost-cutting trick that Sony pioneered twenty years ago on its long-since-discontinued ICF-5900W shortwave portable, and it works well.

Of course, for shortwave this means you don't have to put up with signals repeating at lower strength 900 kHz below the actual frequency—a real plus. But even on AM, single-conversion radios, especially with 450 kHz IFs, sometimes produce unwanted whistles and other interference on the low end of the American AM band, which has 10 kHz channel spacing. Double conversion cures this.

The SW40's dynamic range is good, too, and its audio quality and sensitivity are okay. As to selectivity, the single bandwidth was obviously chosen to give good fidelity to reasonably powerful, clean signals. For these types of stations, it works well, but it's really too wide for listening under highly congested or DX conditions.

■ Quality radio sans complexity

Which brings us to what Sony has apparently tried to do with the SW40. Without a keypad or SSB, and with a reasonable but somewhat wide bandwidth, this is clearly not a radio for enthusiasts. But it fills the bill nicely for travelers and program listeners at home who want something handy and uncomplicated to operate, yet which also has good reception quality for listening to the major stations and even a share of lesser broadcasters.

For many shortwave listeners, this is a winning formula, and why the SW40 is so appealing. It focuses on the things of interest to the vast majority of listeners in the real world, not enthusiasts. For the rest of us who have a passion for shortwave—and that's most MT readers—there's no end of other models from which to choose, like the Sony ICF-2010, or one of the portatop or tabletop models.

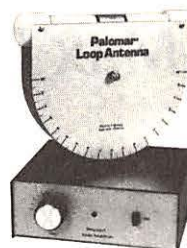
But as enthusiasts, we're often the people lay folks turn to for advice on a first receiver for tuning in the worldwide wonders of shortwave. While the SW40 may not find its way into many of our radio collections, it is equally one of the best models around for "technically challenged" friends, co-workers, and relatives wanting to tune in the world's radio offerings clearly, yet without fuss or fear.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

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Max Discone and Uniden Beartracker

Is the glass half full or half empty? Some say a discone antenna provides uniform, predictable gain and a good impedance match over a wide frequency range. Others say the discone provides uniformly lackluster gain over a wide frequency range, is above DC ground, and poses some unique construction problems. Both views have merit, and whether you are impressed with a discone depends on your expectations.

The new MAX System wide band discone resembles a miniature version of the larger discone antenna sold in your neighborhood Radio Shack store. The MAX discone is only 5-1/2" tall because it is designed to cover a higher frequency range, 800 - 3,000 MHz.

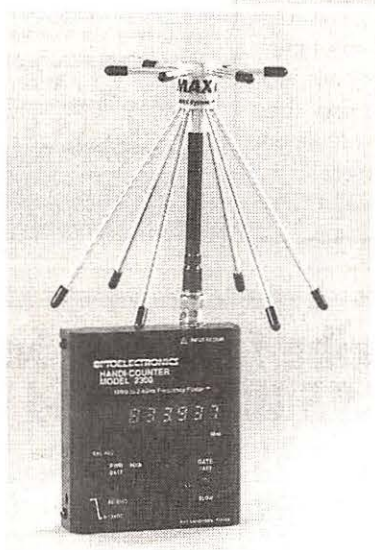
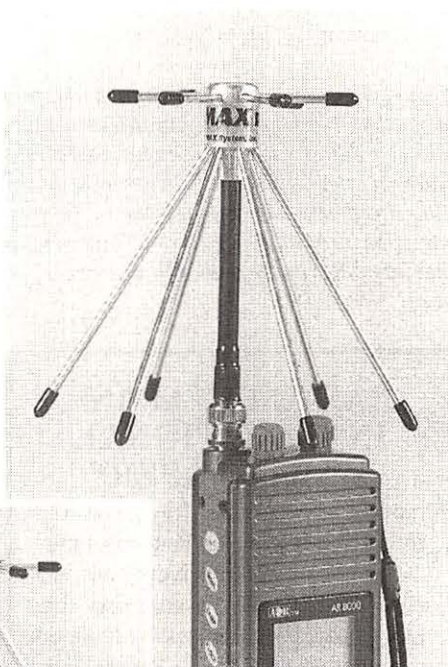
It is constructed of several metal rods, threaded at one end, and capped with plastic at the other end. The rods are screwed into a turned, aluminum hub. The center support appears to be constructed of small diameter hard-line and terminated with a BNC connector.

The MAX Discone will mount atop a portable scanner or frequency counter, but its porcupine-like construction makes direct mounting on other equipment daunting. A

feedline and remote mounting is required to use the MAX Discone with spectrum analyzers, bench frequency counters, or base scanners.

The instructions state waterproof sealing is required at the BNC connector for outdoor use. Supporting the discone outdoors by the BNC connector alone seems unwise, due to stress caused by wind. Our MAX discone was furnished sans mounting hardware and affixing it to a vertical pole would require a small hose clamp and shim.

We listened to the same weak signals on a Uniden/Bearcat BC3000XLT portable scanner using three antennas: the MAX Discone, the stock Uniden rubberized antenna, and an ICOM FA-1443B dual band rubberized an-



tenna. In the 850 - 950 MHz range, signals were no stronger using the MAX Discone than the stock Uniden antenna, and the ICOM FA-1443B outperformed both antennas. As expected, the MAX Discone was a weak performer in the VHF-high band, well below its cutoff frequency.

The MAX Discone carries a suggested retail price of \$49.95 and is sold through

dealers and directly from MAX System, Inc., 4 Gerring Rd., Gloucester, MA 01930, telephone (508)281-8892.

■ Searching by Service and Geography

It was 1979 when William Baker of the Masco Corporation applied for a patent covering a Service Search feature. Baker invented a better way to scan signals in police, fire, or other services than merely searching between two frequency limits. Allocations for a given service are often intermixed with frequencies of other services. Further, Baker pointed out that services, e.g. aircraft and fire, may use different emission modes and require activating different detector circuits with the same receiver.

US patent 4,270,217 was assigned two years later to Masco, which owned Electra, maker of the Bearcat scanner line. Electra embodied Baker's Service Search concepts in their BC220 and BC300 models. Competitor Regency offered Service Search in their K500 model, too.

The next advance beyond scanning signals by service was scanning by geographic location and is described in US patent 4,888,815, granted December 19, 1989, to inventors William Ahlemeyer, Ben McCormick II, and Stephen Crum. It's no surprise this patent is assigned to Uniden America Corporation. In part, the background section of the patent says:

"...In some applications it would be desirable to scan more ... channels, and to periodically change the frequencies in the scanning sequence, without the time-consuming and inconvenient task of reprogramming memory. For example, commercial truckers commonly have reason to monitor police-band radio activity in the various geographical regions, e.g., states, in which they operate. Many states have more than sixteen channels allocated by the FCC for police use, and the frequency allocations vary from state to state. As a result of these and other factors, conventional scanning radio receivers cannot satisfactorily provide regional scanning..."

The patent summarizes the invention, which is a "scanning radio receiver capable of operating without reprogramming in a plurality of geographical regions. The receiver includes a frequency synthesizer coupled to a memory in which digital codes with the public-service-band frequency allocations for each of a plurality of geographical regions are stored. Switch means are provided for selecting a geographical region, and in response to such selection a control circuit sequentially reads the digital codes for the public-service-band frequency allocations for the selected geographical region and loads the frequency synthesizer with each digital code read from memory..."

That pretty well describes the Informant INF-50, sold under the Regency label. It was preprogrammed by state as well as service. Uniden, the Japanese company which bought both the Bearcat and Regency scanner lines, replaced the Informant with BearTracker scanners.

■ Uniden/Bearcat BCT-10 BearTracker

That brings us to the new BearTracker BCT-10, a special purpose scanner which looks more like a radar detector. It is designed for mobile use and furnished with a spring clip for mounting on a sun visor and a bracket with suction cups for mounting on the inside of a windshield.

Frequency coverage is limited to preprogrammed NOAA weather, police, and "highway patrol" frequencies in the 37.02 - 46.02, 138.345 - 172.0, and 423.0 - 508.4875 MHz ranges. Up to 50 channels may be locked out from the scan. Although the BCT-10 is technically a scanner radio, it affords no way for owners to program their favorite frequencies like the larger BCT-7. There is no frequency display, so you cannot tell to what frequency the BCT-10 is tuned.

You can scroll through the two-letter state abbreviations, e.g., IL, IN, etc., and select the state you wish to scan, or you can scan frequencies for all states. You can choose to scan highway patrol frequencies, highway patrol plus local police, or weather channels. There are side mounted controls for volume and squelch, and a way to choose local or distance sensitivity settings, too. Pressing a Hold button temporarily stops the scanning, and a second key press causes scanning to resume.

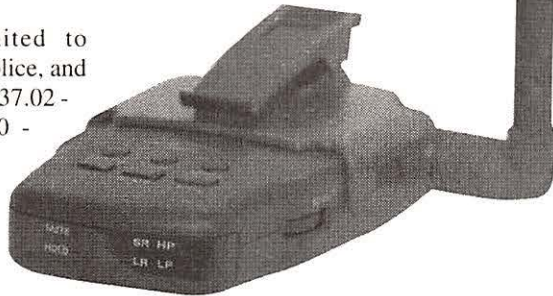
Every two seconds, the BCT-10 samples the mobile extender (in-car repeater) frequencies for your state. If the BCT-10 hears a signal on the mobile extender frequency, a beep sounds, a bright red LED lights, and the relative signal strength is shown briefly on the display. A mute button permits the alarm beep to be softened or disabled.

Our BCT-10, sales sample #8, measures a 12 dB SINAD sensitivity of 0.75 uV on VHF-low, 0.79 uV on VHF-high, and 0.5 uV on UHF. The modulation acceptance is a reasonable 14 kHz. Our BCT-10 produces a tinny 0.6 watts of audio output at 10% distortion when powered by a 13 VDC lab supply. It draws about 220 mA with the squelch open.

The BCT-10 spent more time in use on the road than on our test bench. We kept it mounted on the sun visor, but it interfered with visor operation. The speaker is mounted on the case bottom but most of the controls are mounted on the top. If you mount the BCT-10 on the sun visor, you can hear the activity but cannot see the pushbuttons.

The BCT-10 has a BNC style antenna connector and is supplied with both a rubber helical antenna and a wire antenna mounted to the window using suction cups. (The manual refers to 10 clips for the power cord, but Uniden says that reference was supposed to

have been removed.) Our BCT-10 was pretty sensitive using the helical antenna inside the car, allowing us to hear UHF police transmissions two counties away. We heard interference from cellular telephone calls infrequently.



Scanner enthusiasts may find the BCT-10 lacking. You can enjoy listening to the BCT-10 but can only guess at station identity because there's no frequency display. The larger BCT-7 has a frequency display and can be programmed, making it more useful. The BCT-10 is better suited to truckers and other drivers who want to listen in casually on police radio traffic as they drive.

BCT-10 is \$179.95 from Grove Enterprises.

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A Legendary Reputation Well Deserved

One hundred years ago, in his pioneering work that first demonstrated the existence of radio waves, Hertz used several types of antennas which are still in use today. One of those antennas was our old friend, the half-wavelength dipole antenna: the most popular antenna ever utilized in radio communications. A fair-sized book could be written about just the variants of the dipole antenna, and it would be worth reading, too! Let's take a look at some of the dipoles in common use.

■ Dipoles, dipoles, dipoles!

The most well-known dipole configuration is that work horse of the radio communications field—the half-wavelength dipole. On HF you can mount one horizontally at a quarter wavelength above ground to create an excellent antenna for close-in communications (fig. 1A). If you raise the same antenna to a half wavelength above ground, it will support relatively low-angle DX work. Mount it at a slant to the ground, and you can call it a “dipole sloper,” an antenna with some worthwhile forward gain off its lower end. Mount the center of a dipole high and the ends low,

and you have our old friend the inverted-V antenna with its non-directional reception pattern.

It might seem like a foolish act to plant one underground (or under water), but that would give you a quiet (low-noise), very-low-gain antenna which is relatively resistant to lightning-induced damage. By the way, it is also resistant to derogatory comments about its visual appearance—because it has none!

If your real estate isn't large enough to put up a full-length halfwave dipole you can bend its elements into a “Z” shape or other design to make the antenna fit your lot, and still have a decent antenna. You can also shorten the dipole by adding loading coils, or make it multiband by using traps. And you can just plain shorten a dipole antenna from a half-wavelength down to perhaps even a fourth wavelength before you do real damage to its ability to give you decent service.

And let's not overlook the use of half wavelength dipoles as elements used to make up more complex antennas. In beams such as the Yagi-Uda and LP-array, each driven element, reflector, and director is essentially a variant of the half-wavelength dipole antenna.

Even the elements of the cubical-quad beam antenna were derived by “opening-up” a half-wavelength, folded dipole. Half-wavelength dipole elements are also used extensively to attain increased gain and flattened vertical patterning in collinear antennas.

It is well known that the null (direction of minimal response) off each end of a dipole antenna will reject interfering signals to some degree: just point either end of the antenna directly at the interference. On the other hand, when the dipole is mounted relatively near the ground, as it usually is, the nulls become less deep. Thus, in most installations, this antenna can be used for “all-around” reception, although with the shallow nulls it retains it is not fully non-directional.

If we take the dipole antenna up to VHF, its small size on that band makes it easier to construct and use than on HF. Give your dipole a number of elements of the appropriate resonant lengths for the scanning bands, and it makes a great “cluster-dipole” scanning antenna. In earlier days a horizontal, VHF, half-wavelength dipole was often bent into a circle to make the non-directional “halo” antenna. Designed for mobile work, the halo can

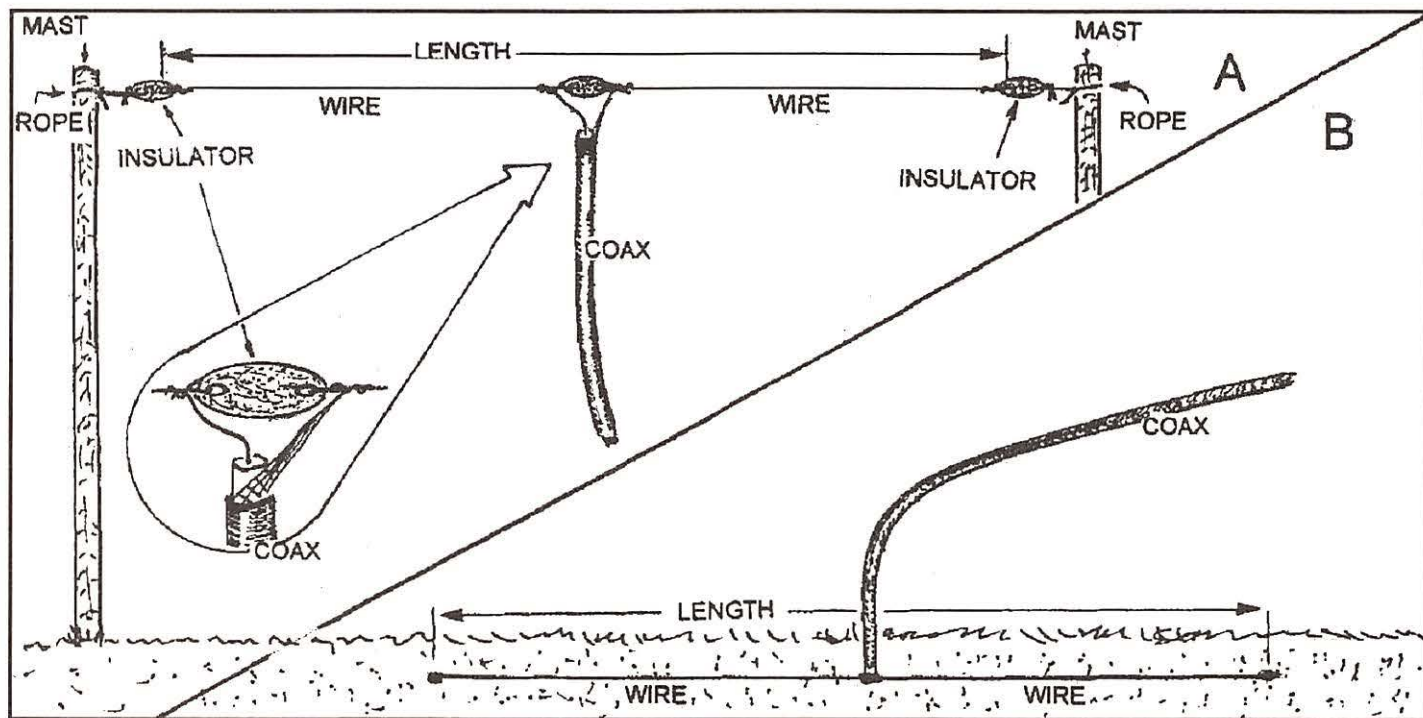


FIGURE 1: Halfwave dipoles in the air (A), and underground (B).

be elevated with a vertical mast, it gives horizontal polarization, and yet it has low enough wind resistance to remain on the mast at high speeds.

Move on up to microwave frequencies with the half-wavelength dipole design, and its dimensions become small indeed. Its minute size on these frequencies allows the construction of very high-gain beams with their many dipole elements. And, because of their small size on microwave frequencies, you can stack these beams into magnificent room-sized arrays for even higher gain and sharper directivity. Put a half-wavelength dipole at the focal point of a parabolic reflector, and reap the extremely high gain and cigar-shaped directivity pattern of that popular dish antenna.

As you can see, the halfwave dipole is a tremendously versatile skywire, and it's hard to beat a half wavelength dipole for economy of cost and of installation effort.

■ Let's Make Some Dipoles

The Basic Half Wavelength Dipole:

1. As shown in fig. 1A this antenna consists of a half wavelength of wire separated at the center into two quarter wavelength sections. Just about any wire that is strong enough will work, but regular antenna wire may last longer on long spans. Determine the length of wire needed from the equation below. Add about eight inches to this length to allow extra wire for wrapping through the insulators.

$$\begin{aligned} \text{DIPOLE LENGTH (FEET)} &= 468/\text{FREQ (MHz)} \\ \text{or} \\ \text{DIPOLE LENGTH (METERS)} &= 143/\text{FREQ (MHz)} \end{aligned}$$

For example, a 10 MHz half wavelength dipole would be $468/10 = 46.8$, or about 46 feet and 9.6 inches long. Add 8 inches to this for a total of 46 ft and 17.6 in, or 47 ft 5.6 in total length.

2. Fit the insulators onto the wires. Then scrape any insulation from the wires at places where they will wrap together after going through the insulators.

3. Wrap the wire ends to hold the wire on the insulators. Solder the wires where they wrap each other. Also solder the feed line conductors as shown with the center conductor to one wire and the outer shield conductor to the other wire.

4. Tie the antenna as high and in the clear as practical.

5. If you live in lightning country be sure to use protection against lightning-induced damage. At a minimum never use the antenna in weather likely to produce lightning; disconnect and ground the antenna when it is not in use.

■ Let's Go Underground!

To make a half wavelength underground dipole (fig. 1B) use the equations below.

$$\begin{aligned} \text{LENGTH (FEET)} &= 312/\text{FREQ (MHz)} \\ \text{or} \\ \text{LENGTH (METERS)} &= 95/\text{FREQ (MHz)} \end{aligned}$$

1. Use only wire with insulation that will resist the intrusion of water.

2. No insulators are needed, just scrape the wire ends and solder them into the dipole configuration as shown in fig. 1B. Seal wire ends and all connections well with coax-type sealant, and then with plastic tape.

3. Bury the antenna no more than a few inches below the surface of the earth: the closer to the surface the better it will receive.

4. This antenna will be satisfactory only with very strong signals. It is relatively immune to much radio noise, and that helps, but it should be used only where having it underground is worth the loss of considerable received-signal strength.

RADIO RIDDLES

■ Last month:

We said that Marconi, who is often called "The Father of Radio," used a large kite to support the antenna which received the first transatlantic wireless transmission. Then we asked "What was the message that was received on that occasion, and why did reception of that message ultimately affect the value of stock in the transatlantic cable-telegraph industry?" Well, the message was simply several repetitions of the letter "S" in Morse code, but the impact of that simple message was to prove that transatlantic radio was a possibility. That impact sent a tremendous shock wave through the ranks of the transatlantic cable-telegraph folks. As history has shown, they were right to be concerned; radio soon began taking most of their glory and profits.

■ This Month:

Should you agree with me if I were to claim that every antenna is both a receiving antenna and a transmitting antenna, or, worse yet, that every exposed conductor is both a receiving antenna and a transmitting antenna?

You'll find the answer to this month's riddle, and much more, in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

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April, "Magic Wand Antenna," by Jacques d'Avignon, p.15: "Just to let you know, I assembled your antenna this evening and tried it against my 45 foot longwire antenna in my attic. I have a 13 year old portable 4 band General Electric Shortwave Radio. The indoor reception on the stake antenna was stronger than my longwire. The longwire would bounce between 4 and 10 on my signal strength meter and the stake would bounce between 8 and 10.

"As soon as the weather clears up, I will take it outside and test it while I set up my 8 inch Dobsonian telescope and look at the stars. It will help pass the time while I set up my telescope and wait for the darkness. I'll let you know how it works. Thanks for the great article in *Monitoring Times*!"

—Jack Fox

May issue, "Uniden: Poor Service," letter to editor by Larry Wiland, p.104: "I own two Uniden scanners, and in the past two months I have placed three orders through their 800 number. I also experienced long hold times (8-10 minutes in my case). However, I received my orders within five days, intact.

"Like Mr. Wiland I ordered a CTCSS tone board directly from Uniden. It was well-packaged. The prongs were stuck in styrofoam, the board was well-wrapped with bubble wrap then placed in a small box. The box was placed in another, larger box along with more bubble wrap and wadded paper.

"As with any place of business, problems can happen. But I am very satisfied with Uniden's service and I saved 20% off prices on optional equipment over other mail order firms.

"Please publish this letter so that other hobbyists know that things are not as bad as people want them to be at Uniden."

—Tom Siemers, Dubuque, Iowa

May issue, "Letters" re audio-only VCR, p.4: "Peter Olsen's letter about audio recording on a VCR is an issue we hear about often on our Tech Support Lines. Generally, VCR's require a video signal to be present at the input in order for audio to be recorded. The video signal is used to create the 'control track' that the VCR uses as a sync reference. This method is similar in purpose to the holes that run along the edge of 8 mm movie film.

"Some VCR's that offer 'HD' or 'Hi-Fi' audio do offer the ability to record audio without video. This actually allows you to get up to six hours of very high quality audio on

a standard VHS tape. These VCR's have their own sync generators that mimic the video signal normally required.

"The point to my message is that the majority of VCR's will not allow audio to be recorded unless a valid video signal is also applied to the VCR. Consult the owners manual to see if it offers 'audio only' recording."

—Bob Kozlarek, WA2SQQ,
Tech Support, Panasonic

Selected Shorts

• "I recently discovered something I always suspected, but have *never* seen in print. I have read dozens of articles and books on cordless phones. Until today I assumed all of the 900 MHz cordless phones employed spread spectrum technology or digital encryption. Boy, was I mistaken!

"The very first cordless phone I ever purchased was a 900 MHz phone that advertised it was spread-spectrum. I tried to receive it on my ICOM R-9000. I couldn't even receive static.

"A few years later I needed a new phone. I settled on a General Electric 900 MHz phone. It didn't advertise encryption or spread-spectrum, but, as I mentioned, I have yet to read one article that states specifically that some 900 MHz phones are prone to interception. It took all of about one minute in the search mode to find my phone! I found it loud and clear.

"I ask that you please alert your readers. I'm no expert by far, but I consider myself well-informed. I'm sure there must be other readers out there who might think all 900 MHz are secure. Please let them know they're not."

—Rob Martens KB2VXN,
Cinnaminson, New Jersey

• "Along with all the other influences that are tending to ruin our enjoyment of shortwave listening and amateur radio (sunspot cycles, satellites, internet, etc.) we now have the radio frequency spectrum crowded with evangelists and religious choirs, and I suspect I am not alone in being very 'turned-off' by them.

"I got into a polite discussion with one of them on 20 meters one day and was *bombarded* with Bibles and leaflets for months afterwards. There is, of course, nothing we can do about them, but if ... people would stop sending them money they would stop broadcasting soon enough!"

—Dick O'Neill, Naples, Florida

• "It strikes me as phoney for a certain subset of a special-interest hobby group to continually try to influence the Canadian government. Why not just let RCI die, instead of periodically resuscitating it for the next crisis? Canada obviously has very little to gain by subsidizing these broadcasts, and with its resources already over-allocated, should just let this overseas charity go."

—Hue Miller, Salt Lake City, Utah

• "I was wondering if anyone remembers the few Sanyo shortwave radios there were around in the 1970s? I had a few, but unfortunately sold them, not knowing that they would be rare and hard to find. If anyone has any I would like to know what models were made."

—Jim Pirola
7766 Worthington Galena Road,
Worthington, Ohio 43085;
PirolaJ@Liebert.com

• "As you know, the Courage Handi-Ham System provides study materials on cassette tape for persons who cannot read regular print. Through the years, we have provided such materials to thousands of members who could not otherwise depend on having current study materials read by an experienced amateur radio operator. Unfortunately, our tape production equipment is at or beyond the end of its useful life. Won't you please consider helping us with the following 'wish list' of equipment that we must have to continue this vital service?: Two professional quality adapted 4-track recorder/players (about \$370 each); Telex (or similar) high-speed 4-track duplicator (about \$2,500)."

If you can help, please contact Patrick Tice, WA0TDA or Sister Alverna O'Laughlin, WA0SGJ, Handi-Ham Headquarters, Courage Center, 3915 Golden Valley Road, Golden Valley, MN 55422.

Safe holidays to one and all. Thanks to REACT and other highway helpers for being there. Whether you're in your car or at home with a CB, scanner, GMRS radio, or ham transceiver, be a part of the radio community; you never know when the signal you hear may be one of those lifesaving or newsbreaking monitoring times!

—Rachel Baughn, mteditor@grove.net

Send Letters to the Editor via e-mail or to
PO Box 98, Brasstown, NC 28902. Letters may be edited for brevity and clarity.

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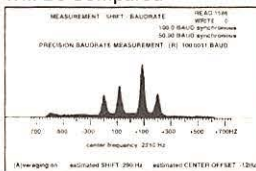
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ACARS is the acronym for Aircraft Communications Addressing and Reporting System. Decoding VHF ACARS digital traffic from high-flying aircraft is fast becoming a popular pastime among digital mode monitors. When your editor first ventured in the ACARS realm, three years ago, only the two decoders were available. Today, there are about six manufacturers to choose from. Lowe Electronics, one of the first pioneers in this area, currently markets their Lowe Airmaster version 2. Connected to a PC COMM port the unit is not much bigger than the business end of an RS-232 interface connector. A lead from the unit connects to the audio out of your scanner or VHF receiver.

The Airmaster has several advantages over other decoders: it is more sensitive to receiving traffic, it is small and requires no power (very handy for in-the-field operations with a laptop or notebook), and you have the option of not displaying messages with parity errors (in other words, it won't print garbage).

Its main drawback, however, was the size of the log files it generated. Consider the following two messages and notice how the Airmaster formats each message as a separate information package.

```
[15/04/1996      20:04]
ACARS mode: 2 Aircraft reg: .C-FCAJ
Message label: 80 Block id: 3 Msg. no: 0422
Flight id: CP0054
Message content:-
1101 OFFRP 0054/15 CYYZ/LFPG .C-FCAJ
/OUT 2345/OFF 0004/FOB 0852/ETA 0654
```

```
[15/04/1996      20:05]
ACARS mode: 2 Aircraft reg: .C-FCAJ
Message label: H1 Block id: 4 Msg. no: D001
Flight id: CP0054
Message content:-
#DFBTKO YYZFPG0054
00041504P121P0085P0148825531456004
L 10730991P0751022797P0743417854
R 10730991P0741023809P0743417664
L P0123160P082015500160280240101
R P0123162P0830158707807504301 1
```

A day's monitoring can easily produce several thousand messages, and if you wished to assemble all the messages from a particular flight, you had a real work-out ahead of you in your favorite word processor.

Necessity being the mother of invention, an enterprising Dutch aviation enthusiast and ACARS aficionado, Bart "Beaver" Hoekstra,

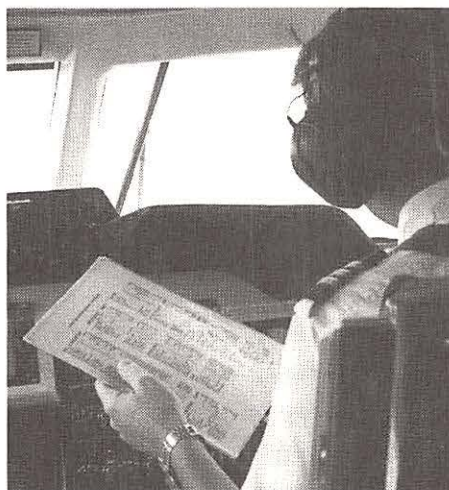


Photo by Harry Baughn

rose to the challenge. With the version 2 release of his shareware program (DACARS), the Lowe Airmaster now becomes the decoder of choice.

■ How It Works

The chosen *.LOG file is read record after record. When a new record is read the program does the following:

- It checks the flight number and registration for invalid characters. Non-validated flight and registrations are ignored.
- It checks if the registration and flight number were noted previously in other log files. If so the program skips to the next record. When a registration already recorded is logged again with another flight number, it will be treated as a new flight, and vice versa.
- When a new flight that has not been logged before shows up, a new record is created in the *.DBF file with the relevant info for this flight
- The program checks the 'all heard' database. If the registration and company have been logged before, the last noted date will be updated.
- If the registration and company are not in the 'all heard' file, the program will add a new record to this file, and the first and last-noted dates will be the same. An asterisk (*) will also be placed after the registration in the *.DBF file, so the aircraft logged for the first time can be easily spotted when viewing a log file.
- DACARS next repeats the above procedure with the flight number. The 'All Flights' database is updated and asterisks are placed

on first heard flight numbers.

- Finally, it takes a look at the message sequence number. If the message sequence number is the same as in the last message for this flight, the message will be ignored. If it's a different message number, the message content will be copied to the *.DBT file, which can later be viewed. The DBT file will contain only unique messages per flight-id.

Once the summary file has been created from the Airmaster log, you may sort it by Date/Time, Aircraft Registration, or Carrier Code. Pressing the Return key will display a summary of all traffic for the flight. You have the option to generate the summary file in DBF or ASCII format for later import into other databases or spreadsheets.

```
Registration: C-FCAJ
Flight number: CP0054
Date: 04/15/1996
[20:04]
1101 OFFRP 0054/15 CYYZ/LFPG .C-FCAJ
/OUT 2345/OFF 0004/FOB 0852/ETA 0654
```

```
[20:05]
#DFBTKO YYZFPG0054
000415 . . . (same message) . . . 1
```

*** summary created by DACARS V2.0 ***

FIRST DATE	LAST DATE	FLIGHT-ID	COUNTER
12/04/1996	20/05/96	CP0054	23

This summary can be printed or saved as a text file. With version 2 of this program, you have even more options. Wouldn't it be nice to know who is the airline carrier, what type of aircraft is in use, and what are the points of origin and destination for the flight?

Thanks to another Dutch ACARS enthusiast, Hans Wildschut, Bart has included the following three databases:

- Airline Carrier information on 634 companies
- Aircraft registration information on 8,355 aircraft
- Flight Routing information for 2,293 international flight numbers.

Each of these databases is fully editable and the user may add his own entries. So, in addition to displaying all the message text information, pressing the F4 key results in the following additional information:

Registration: C-FAJ
 Flight number: CP0054
 Date: 04/15/1996
 Operator: Canadian - canadien
 Country: Canada
 Home base: Calgary
 IATA: CP
 ACARS: CP
 ICAO: CDN
 Callsign: Canadian

Route: CYYZ Toronto - LFPG Paris CDG

Aircraft type: B-767
 Construction nr.: 24086
 Owner: CDN
 *** summary created by DACARS V2.0 ***

System requirements:
 IBM compatible PC
 MS-DOS 2.1 or higher
 about 200 kb free disk space
 about 400 kb free memory
 Lowe Airmaster 2.0 or 3.0

And now for the best news of all: DACARS is available for a shareware fee of \$15.00 U.S.! You can visit Bart at his WWW site at <http://www.epsilon.nl/~bart/index.html>

There's a free demo version on the Web site that you can download. Once Bart has confirmed your order, he will download a zip file to your e-mail address. He may also be contacted at the following:
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While you're on the Web, why not also visit with Hans at the following URL? <http://web.inter.nl.net/hcc/Hans.Wildschut/>

■ Where Have All the Russians Gone?

Since the demise of the former Soviet Union, Soviet Maritime transmissions have been greatly reduced in number. Morflot, the old Soviet fishing fleet, has been split up among the various republics, and many of the old vessels have been sold off or reflagged.

Despite this, there is still plenty of RTTY and SITOR-A (TOR) traffic to intercept. Generally speaking, fishing vessels continue to utilize RTTY (normally 50 Baud/170 Shift), while motor vessels (cargo, carriers, tankers, etc.) prefer SITOR-A. Occasionally you will come across a vessel transmitting in SITOR-B (FEC) as well.

As a general rule (but there are exceptions), RTTY transmissions tend to be found at the upper end of each band range. The following frequency ranges are currently the most active for ship-to-shore traffic.

TO	FROM
6309.0	6414.0
8373.0	8412.5
12553.5	12574.0
16796.0	16804.5

■ Mariupol Radio

Mariupol Radio (USU), located in the Ukraine, can be found most days before noon Eastern Standard Time on 12615.0 kHz. In addition to providing both SITOR-A and B broadcasts to vessels of the former Soviet block, they also have an automated vessel message service. Traffic often consists of a strange combination of Cyrillic messages and English prompts and instructions. Obviously the automated traffic software they purchased was programmed in English! Consider the following examples.

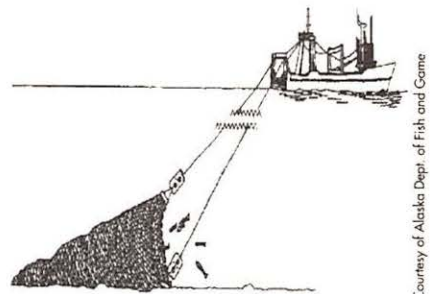
(NOTE: This transmission was originally decoded in Cyrillic. The Russian text has been transliterated into the Latin alphabet, hence the unusual special characters and squiggles. Since most of us don't understand Cyrillic anyway, your editor didn't bother to correct the text.)

BCT ASI021139 10211636 ROUTE (262)
 NETA034 10221545 /UFFT
 BCT UFFT
 mariupol doneckoj 10/7370 29 21/10 1639=
 mariupol 88 dnc th lon popow prokofxewu=
 witenxka rodnoj moj zdrowstwuj o4enx vdu
 twoego zwonka doma wse
 horo lo sku4aem ne mol4i kak 4uwstwue lx seba
 obnima~ krepko celu~=
 l-da deti-
 nnnn
 +++ NIL
 GA+?
 2..TIMEOUT
 NETA1022157 /UFFT 95/10/22 6:11 INPUT
 ERROR-DELAY POSSIBLE
 NETA1022158 /UFFT 95/10/22 16:12
 INPUT ERROR-DELAY POSSIBLE
 +++ END
 TYPE URG+ TO REGISTER
 0 PRIORITY 0 SYSTEM 4 OTHER
 GA TEXT
 UR QH O.K
 GA+?
 NETA1022167 /UDTR 95/10/22 16:30
 ACCEPTED
 +++ END
 GA+?
 STF TGAI1022052 10221223 marTGAI (1295)
 NETA042 10221640 /UDTR
 STF UDTR
 mariupol 1570 b/s 22/10 1220=
 radio th rostow na donu km zagrebinu
 dubliru~ inf agenta bukirowkam sawony ,liworno
 latynx
 A) ETA SAVONA 25.10.1995:
 CNTRS TO MARIUPOL:
 - 1X20' EQUIPMENT 10 TONS TI
 - 1X20' N. 1 CAR 3 TONS TI
 - 1X20' EQUIPMENT 5 TONS TI
 - 13X20' MACHINERY EACH TONS 21 TI
 - 1X20' FURNITURE TONS 15 TI
 - 1X20' MACHINERY TONS 5 TI
 - 3X20' MACHINERY EACH TONS 14 TI
 - 4X20' WINE
 TOTAL: 25X20' CNTR

B) ETA LEGHORN 26.10.1995:
 CNTRS TO MARIUPOL:
 - 1X20' FURNITURE TONS 15 TI
 - 1X20' SHOES AND GLUE TONS 6 TI
 - 3X20' SAFE CHEMICALS EACH TONS 23 TI
 CNTRS TO SALONIKKI:
 - ABT 25/30X20' TILES EACH 23 TONS TI
 - 1X40' TILES 27 TONS TI
 CNTRS TO DAMIETTA:
 - 106X20' CNTRS EACH 10 TONS
 BRGDS GALLEANO
 nnnn

BCT ASI0706064 07061236 ROUTE (277)
 NETA006 07070028 /UWTFB
 BCT UWTFB
 mariupol doneckoj 54/1253 20 6/7 1210=
 mariupol 88 doneckoj transflot teplohod
 akadesmik
 n bjrt iwanowu aleksandru witalxewi4uv=
 pereda4u polu4ila spasibo u menq wse horo lo
 l-bl- celu~=nata la-
 nnnn
 YOU HAVE BEEN LOGGED OFF YOUR MAILBOX
 +++ NIL
 NIL
 GA+?

■ Tuning RTTY from Coast Guard Cutters



Courtesy of Alaska Dept. of Fish and Game

Most Utility monitors are familiar with the USCG's Systems Coordination Net (SCN) HF voice frequencies. These USB voice channel pairs are used by the COMMSTAs (Communication Stations) to exchange information related to SAR (Search & Rescue), operational and administrative matters, inter-cutter/shore station traffic, and high seas weather broadcasts. Coast Guard cutters often receive voice instructions to tune to specific RTTY frequency windows for transmissions to or from COMMSTAs.

Five of the most active SCN channel pairs are shown below. The first frequency in the pair is used by the shore station. You will find voice high-seas weather broadcasts at specified times. The second frequency is used by the vessel. Much of the RTTY traffic is cryptic in nature, but you will often see plain text transmissions as well.

COMMSTA	CUTTER
4426.0	4134.0
6501.0	6200.0
8764.0	8240.0
13089.0	12242.0
17314.0	16432.0

Ask the Readers

• From time to time, questions come in which we cannot answer. Such a question was recently submitted by reader Keith White who wants to know if there is any way of automatically editing out commercials on broadcasts.

We are familiar with "cue pulses" which are sent by computerized satellite links to enable unattended stations to transmit recorded local spots at appropriate times, and techniques which recognize the longer blanking interval when a station "dips to black" just before a commercial block, then does the same as it returns to the program.

How about it, broadcasters? What is the secret to automatically detecting the imminent arrival of FM, AM, TV, and satellite commercials, then coming back up in time for the program to resume?

And here are a couple from me:

- Back in November, I asked our technically inclined readers—and received no replies—whether the RF transistor in a receiver would be just as likely to burn out from strong-signal overload whether the radio was turned on or off. More specifically, the same overvoltage appears across the semiconductor junction; is the device more likely to burn out when it is forward biased?
- Finally, what is the code list for infrared

remote control units for all the different functions on consumer audio and TV appliances? Since there are universal remotes, there must be a universal code; anyone know what it is? (Bob Grove, Brasstown, NC)

Q. How do railroad trains communicate with their bases over the endless expanses of the desert? There aren't any towers nearby. (Hue Miller, Salt Lake City, UT)

A. I am told that it is done just like any other backbone system: repeaters on distant mountain peaks hear the transmissions and re-broadcast them from point to point.

Q. I've seen the same model CB antenna advertised as having 9.9 dB gain in one catalog, and 3.3 dB in another. What's the real lowdown? (Mike Elcsisin, Lake Berryessa, CA)

A. Nothing has been abused and misrepresented in the annals of technology like an-

tenna gain figures. The CB market, being especially vulnerable to nonsense specifications, has been victimized the most. One amateur magazine no longer accepts antenna ads with gain figures.

A decibel (dB) is a comparative term indicating an increase or decrease over a reference. If the reference isn't given (as it wasn't in the ads you quoted), it's much like saying, "My engine is 20 horsepower stronger." Than what? Real antennas are advertised as having gains measured in dBd or dBi (decibels stronger than a half-wave dipole or a theoretical, but nonexistent, isotropic antenna).

A 9.9 dBd gain antenna for CB would be around 20 feet long and have six or eight elements. If it's only 3.3 dBd, it could do that with only two elements and be only 3-4 feet long. My guess is that both claims are bogus.

Q. Can I receive police calls on a TV set that has fine tuning? (Martin Theil, Holiday, FL)

A. Only on an older TV set with channels through 83. The upper UHF-TV channels (70-83, representing 806-890 MHz) are shared between two-way users (including public

What are Those Triangular Towers?

My old friend Gene Hughes, publisher of *Police Call*, provided some excellent insight into the topic of cellular telephone towers which we mentioned in the May column. In light usage areas, the triangular tower top supports two, omnidirectional, diversity-receiving antennas and one omnidirectional transmitting antenna; additionally, there is a fourth, inconspicuous, locator receiving antenna.

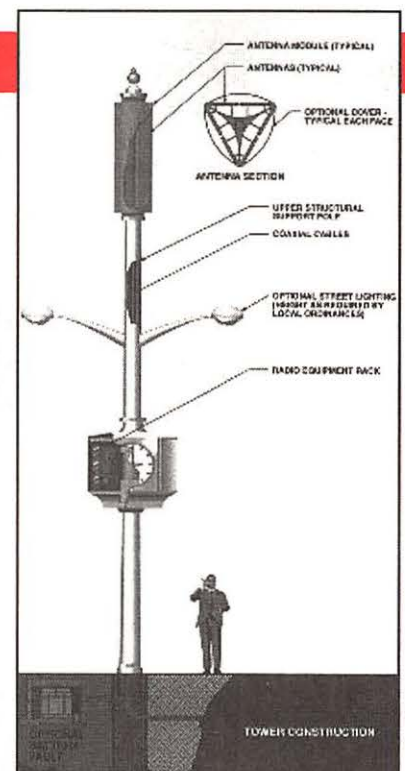
A fully-configured tower may support four high-gain directional antennas on each point of the triangle, pointed to favor specific directions, like along a freeway. Some towers may offer two stacked piers of antennas.

Bob's Tips of the Month

In areas of environmental awareness, towers may be disguised to blend with the landscape, or even placed on existing buildings; there are nearly 400 cell sites in Los Angeles, most of them "invisible."

Thanks, Gene..

TEA Telestructures



safety, business and cellular) and original TV broadcasters "grandfathered" into continued operation after their part of the spectrum was given to the land mobile services.

Q. *There was a theory many years ago that an extremely sensitive receiver could hear or see events which occurred thousands or even millions of years ago. Is this possible? (Robert E. Brock, Phoenix, AZ)*

A. No. Receivers detect electromagnetic radiation which radiates into space at a velocity of 186,000 miles per second. If we focus such a receiver on any spot on the earth, we can monitor only what electromagnetic signal emanated a split second earlier; any radiation thousands or millions of years ago has long since changed to heat and dissipated, or has been lost in the noise of space. To further compound the problem, there were no transmitters back then sending electromagnetic sounds or images to be detected by such a receiver.

Questions or tips sent to "Ask Bob," c/o MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bob@grove.net. (Please include your name and address.) The current "Ask Bob" is now online at our WWW site: www.grove.net.

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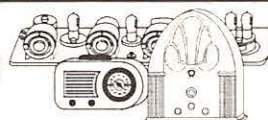
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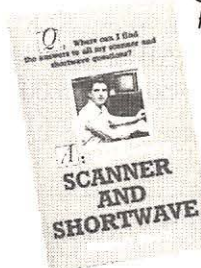
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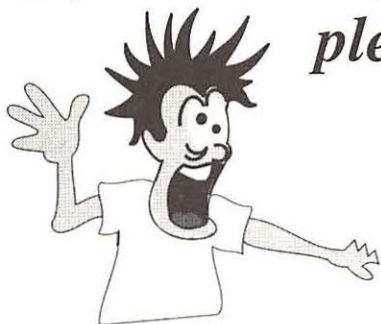
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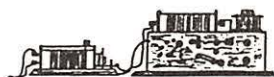
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By Bob Grove,
Publisher

Radio Listeners: Are We Really a Threat?

I received an earnest letter from a reader who was disturbed by a feature in the May issue in which the author described how he followed the Secret Service around listening to their communications. The reader apparently felt that this was tantamount to spying on an agency entrusted with protecting the President.

But under closer examination, what harm was done? Do we really think that after nearly a half century since its formation, no one notices the Secret Service agents surrounding a Presidential event? The Secret Service knows that scanner fans listen in; that's why they scramble sensitive communications. The agents are out in the open, so visibility isn't a problem, and there's an excellent chance that the reporter himself was under observation by the Secret Service!

Radio hobbyists frequently overinflate their importance, and so do some righteously indignant radio users who had been blissfully ignorant of their vulnerability to casual eavesdropping. Both assume that the passive act of monitoring radio communications is a threat to someone.

It is only when information is acted upon that it takes on significance. Many law enforcement agencies are beholden to scanner listeners who volunteer information after they hear descriptions of events or suspects on a police dispatch channel; criminals are often apprehended as a direct result. Similarly, when information, regardless of how it was obtained, is used in a patently illegal manner, it causes harm. It doesn't matter whether you hear it through a wall, an open window, or a radio speaker—the morality is the same. The only difference is that the radio interloper may be more insidious since radio signals travel a greater distance and he may be able to operate in the protection of his home or car.

Licensed amateur radio operators have taken the lead in wooing public opinion in favor of their hobby. They often provide relief and morale messages as well as emergency communications in times of natural disasters. Shortwave listeners and scanner hobbyists, on the other hand, traditionally have not, relegating their interests to self-service, recreation, or amusement, much as a couch potato does with TV.

But technically-minded, public-spirited radio hobbyists can do a great deal to legitimize their hobby in the public eye; for one thing, they can help resolve interference problems, intentional and incidental. Simple radio direction finding (RDF) antennas can be used to track down repeater jammers as well as find noisy electrical devices which confound reception.

CBers have REACT; hams have ARES and RACES—all SWLs and scannists have radios. But what if we banded together, forming a cadre of trained, civic minded volunteers who could assist law enforcement agencies track down disruptive frequency abusers, assist other licensees in resolving interference problems, help homeowners and utilities companies cleanse the airwaves of electrical noise, and so on? Would this be a turning point in the hobby? Would anyone be interested in pursuing it?

For decades, the hobby has been looking for a reason to exist, other than for its own sake. Perhaps that's all it is—a hobby. What do you think?



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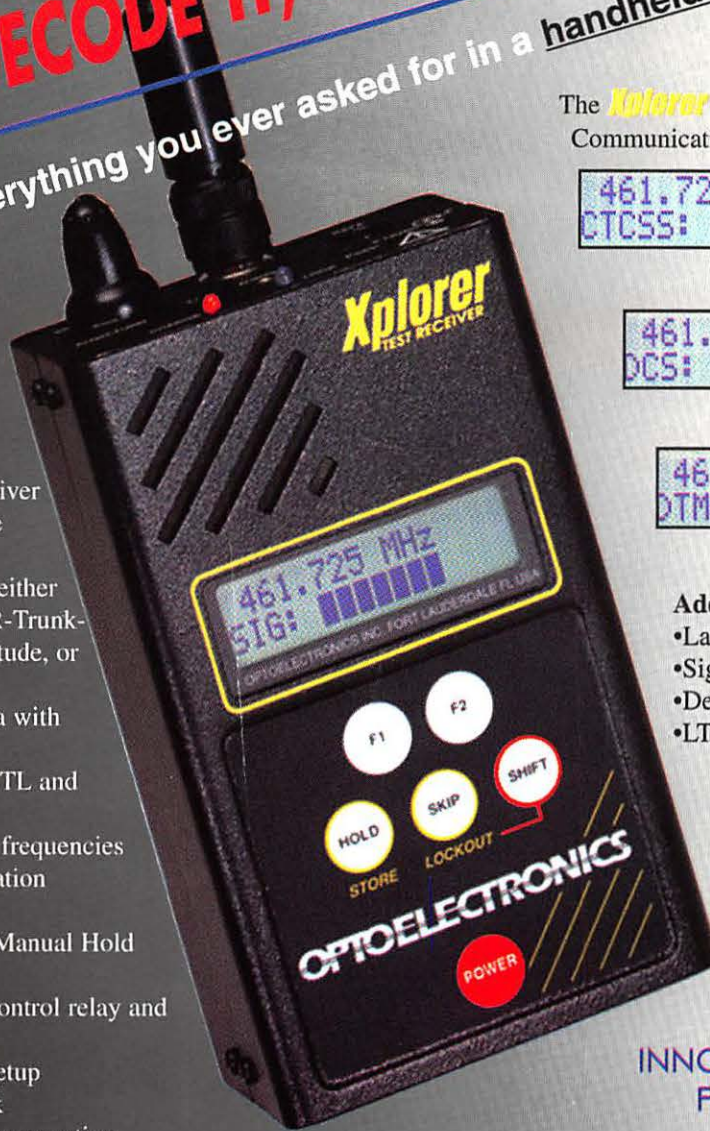
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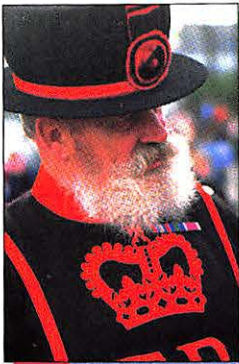
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